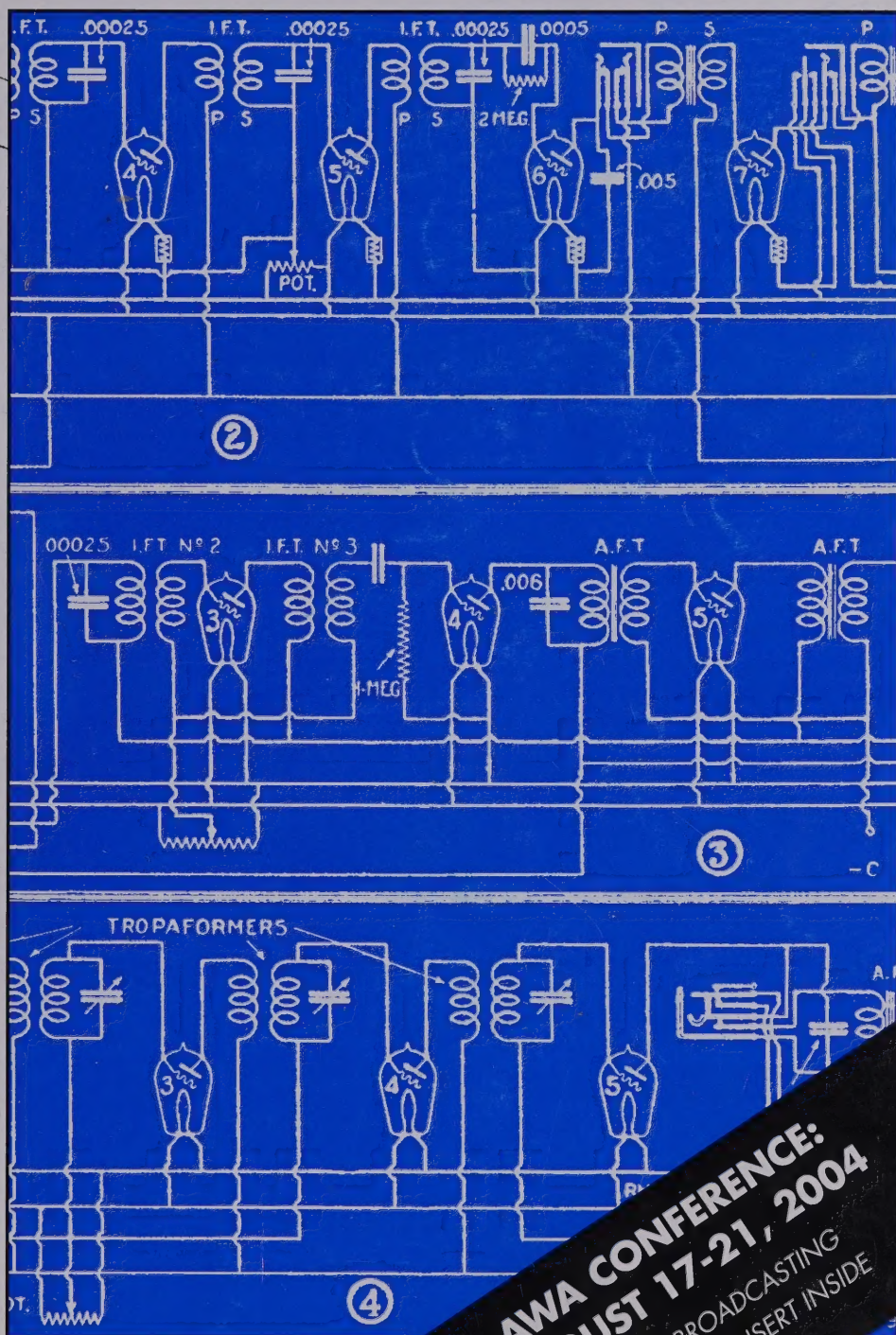


The OTB

OFFICIAL JOURNAL OF
THE ANTIQUE WIRELESS
ASSOCIATION, INC.

*Published for the collector,
historian and old-time
radio operator*

THE OLD TIMER'S BULLETIN JULY 2004 VOL. 45 / #3



Judge's 1925 decision creates
superheterodyne circuit
bonanza (see p. 55).

AWA CONFERENCE:
AUGUST 17-21, 2004
THEME: BROADCASTING
SEE SPECIAL INSERT INSIDE

THE OLD TIMER'S BULLETIN

OFFICIAL JOURNAL, ANTIQUE WIRELESS ASSOCIATION, INC.™

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CONTENTS

COMPLETE CONFERENCE AGENDA

- 10 Additional Lodging at the ConferenceStaff
31 Rochester Conference 2004Staff
The Accommodations, the Seminars, and Those All-Important Contest Categories
57 Introducing AWA Review Volume 17Staff

FEATURE ARTICLES

- 26 A Christmas Trip to Cortlandt StreetMel Comer
Visiting "Radio Mecca" in the early 1920s—An Antique Radio Gazette reprint
42 Who Invented the Grid Leak?David Kraeuter
A little light is shed on one of the more controversial aspects of radio history
47 Flying Radio-Controlled Models in the 1930sLeon Hillman, W2JXJ
Two high-school students advance the state of the RC art
55 How A Judge "Unlocked" the Superheterodyne Circuit Richard T. Ammon
Legal decision loosens Sarnoff's hold on Armstrong's seminal invention

MEET REPORTS

- 43 Niagaradio 2003 Larry Babcock
45 Spring Meet in the Carolinas 2004 Ron Lawrence, KC4YOY

COLUMNS

- 6 AWA NewsStaff
11 Museum NewsEd Gable, K2MP/W2AN
13 New Books and LiteratureDavid W. Kraeuter
16 TelevisionRichard Brewster
Columbia is Telecasting!
17 The Vacuum TubeLudwell A. Sibley
Notes on Tube Bases
19 Key and TelegraphJohn Casale, W2NI
What Did a Railroad Telegrapher Do, Anyway?
22 Amateur RadioJohn Rollins, W1FPZ
2004 O.T. DX Contest Results
24 The Communications ReceiverBill Fizette, W2DGB
The Howard 438, By Jim Hanlon, W8GKI
28 Mics and MenGeorge A. Freeman
The Mic: AKG D202 The Man: John A. Gambling
29 BreadboardingRichard A. Parks
Winter Madness—Creating a Radiola 18-S
37 Radio ReproducersDave Crocker
Ceramic Horn Speakers
38 Below 535Frank J. Lotito, K3DZ
Radio Navigation Systems, VLF Through MF Part 1: Basic Principles
51 Recent Radio, TV and Entertainment Obituaries
Charles S. Griffen, W1GYR
58 On the InternetChuck Schwark
Old Time Radio on the Web

DEPARTMENTS

- | | | |
|-------------------------|----------------------|----------------------------|
| 4 President's Message | 42 Silent Keys | 62 Business Card Ads |
| 4 Letters to the Editor | 59 About Our Authors | 64 Museum Store |
| 5 From the Editor | 60 Classifieds | 66 Museum Store Order Form |

THE PRESIDENT'S MESSAGE

Greetings,

It's almost that time of year again; the annual conference is just a few months away. The dates for the conference are August 17-21, 2004. This year we will be having early registration for the meet on Tuesday, August 17. This worked quite well last year, helping to relieve the congestion at the flea market entrance.



As always there will be no selling or trading on Tuesday. This will be strictly enforced. The purpose of the policy is to give everyone who attends equal access to the items being offered. We will be having a presentation by Tom Perera on the Enigma code machine on Tuesday evening.

Last year there were over 800 attendees at the meet and more than 250 vendors in the flea market. This is one of the largest conferences in the country. You do not want to miss it! See you there.

AWA, Inc. and the AWA Electronic Commu-

nications Museum had their spring meet on May 1, 2004. Over the many years that we have done this meet we have had to put up with rain, snow, cold, heat and just about anything mother nature could think of. But this year we moved from the annex parking lot to the Bloomfield Elementary School. The new indoor location was well received by all who attended and will be repeated next year.

The flea market was just about sold out. I think there were only two empty tables. This meet is going to grow, So plan on it for next May. The Museum staff and volunteers are to be commended for their hard work in making it all happen. Great Job!

Well—enough for now. Hope to see you at a radio meet in the near future. If you have any questions or comments please contact me, But please no calls after 9:30 p.m. if possible.

Geoffrey Bourne

405 8th Avenue, St. Albans, WV 25177

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LETTERS TO THE EDITOR

All letters to the Editor are read with interest and attention, though not all can be published in this column. Letters may be paraphrased, shortened or otherwise edited to fit the available space. The statements made by our correspondents are their own opinions and do not necessarily reflect the views of either the OTB staff or the Antique Wireless Association.

BRUCE KELLEY NET MEETING

The 75 meter Bruce Kelley net met for lunch again this year. We gathered at Peddler's Village in Lahaska, PA on May 13. Members brought home-



Bruce Kelley 75-Meter Net participants at their May 13 luncheon in Lahaska, PA (see letter).

brew projects they have been working on to show off. I distributed net certificates I had created.

A group picture is attached: Front row (l-r) Bill Fizette, W2DGB; Tom Bohlander, WA3KLR; Paul Mooney, K4KRE; Paul Bohlander, W3VVS. Back row (l-r) Roy Brown, WA2TWS; Floyd Jury, W3OLV; Doug Crompton, WA3DSP; Albert Roehm, W2OBJ; Norman Erway, WB2SYQ. The complete set of pictures from the lunch, as well as other net information, is available for viewing at www.crompton.com.hamradio.

Please email me at doug@crompton.com if you need more info. Thanks es 73.

DOUG CROMPTON

by e-mail

GOODMAN SUPERHET IMPROVEMENT

I have read with interest the two Fizette articles on the Goodman two-band, five-tube

FROM THE EDITOR

Welcome to your Conference information issue! It's now in your hands in plenty of time to plan for August 17-21 because this is also the inaugural issue of our new release schedule. As already mentioned a couple of times on this page, *The OTB* will now be released in July, October, January, and April instead of in August, November, February and May. This will provide much more timely information about our mid-August Conference and assist us in more easily conforming to the legal requirements for notification of our November Membership and Board Meetings.

This issue also includes another article from the ARCA *Antique Radio Gazette*. We intend to make this a regular feature, so those of you who were members of The Antique Radio Club of America and have fond memories of the *Gazette* are invited to contact me and nominate articles for reprinting.

Beyond expressing the hope of seeing many of you at the Conference this summer, I don't have much more to report here. So I'm turning over the rest of my space to our Conference Chairman, who has a few words for you.

—Marc Ellis

FROM THE CONFERENCE CHAIRMAN

It's tough to believe that we're soon coming up on another Conference. This year's theme is "Broadcasting." It's a large category, so there should be a lot of theme-related ephemera to study in addition to the radio equipment itself.

This year, as usual, we have a full calendar of displays and events as usual—starting Tuesday evening with a members' mixer followed by Tom Perera's presentation on decoding Enigma messages at Bletchley Park.

Some other unique presentations include those on "Early Radio Detectors," "Charles Herrold," and "Developers of the LRS Relay Tube.

Returning favorites are "Moonlight Restorations," "Pre-1912 Apparatus," and the "Key & Telegraph Seminar," among others. The flea market will provide at least a little exercise while you try to find the perfect items to take home.

Of course the Equipment Contest and the award presentations at Friday's banquet will provide an opportunity for you to reminisce about how many of these Conferences you have attended. For full details on these events, see the special insert in this *OTB*.

Hope to see you there.

—Hugh Davey

superhet receiver. I have not built the receiver as such, but have tried to use the tunable, double-tuned, input circuit with uniformly poor results.

The problem with so-called "bottom end" capacitive coupling (the .001 uFd cap from the tuning capacitor rotor to ground) is that the coefficient of coupling (given by the ratio of the value of either section of the tuning capacitor to the value of the coupling capacitor) varies over a range exceeding 4:1. This leads to a considerable loss of gain on the 40-meter band where the tuning capacities are small.

The problem could be alleviated in several ways. For example, one could add a *small* capacity between the capacitor stators. Or one could ground the capacitor rotors and use a *small* coil for so-called "bottom-end" inductive coupling. Or one could ground the capacitor rotors and the cold ends of the coils and use a large 1/4-watt resistor to couple the capacitor stators as

proposed by M.J.O. Stoutt in his 1947 receiver design book.

JOEL EKSTROM
Cabin John, MD
301-469-6562

FRONTIER CAPACITOR SELLING CAPS AGAIN

A communication recently received from Everett Hoard of Frontier Capacitor announces he is once again selling electrolytic, poly, ceramic and silver mica capacitors. He had discontinued that part of his business about a year ago, retaining only his electrolytic can rebuilding service. Contact him for a flyer.

EVERETT HOARD
403 S. McIntosh St., Lehr, ND
(701) 378-2341
frntcap@bektel.com



OTB POLICY ON PROMOTING EVENTS: The OTB is pleased to list the meets and meetings of any established antique radio organization, whether or not it is associated with the AWA. Do not send your information directly to the OTB Editor. Please send it to Joyce Peckham, Box E, Breesport, NY 14816. Closing date is six weeks prior to first day of month of issue.

Calendar of AWA Activities

August 5-7

ARCI/AWA Radiofest XXIII

August 7

NFWA/AWA Meet

August 17-21

AWA Annual Conference

November 12-14

VRPS/AWA Annual Convention

November 14

AWA, Inc. Membership and Board Meeting

November 14

AWA Museum Membership and Board Meeting

Calendar of Meets

(AWA logo identifies AWA-sponsored events)

ARCI/AWA RADIOFEST XXIII



August 5-7

The Antique Radio Club of Illinois and AWA proudly announce the annual "Radiofest" meet. Conveniently located just 25 miles west of Chicago's O'hare Airport, it is held at the Best Western Plaza and Convention Center, 345 River Road, Elgin IL (southeast of I-90 and just east of Rt. 31). Call (847) 695-5000 for special Conference rates. The event kicks off at 4 p.m. on Thursday with the opening of the parking-lot swap meet. Featured are: old equipment conference; informational presentations; two auctions; fish fry; appraisal booth and hospitality tent. Admission to the swap meet, appraisal booth, and a book signing by radio personality, historian and author Chuck Schaden is free to the public. For seller's fees, registration form and other information visit www.antique-radios.org or e-mail info@antique-radio.org.

NIAGARA FRONTIER WIRELESS ASSN.



August 7

Annual joint meet with the AWA. At the Amherst Museum, Amherst, NY (north of Buffalo). From the NY State Thruway, take Exit 49 (Transit Rd., Rt. 78) north nine miles. Left on Tonawonda Creek Rd. just before entering Niagara County (there is also a Tonawonda Creek

Rd. in Niagara County on the north side of the Creek). Proceed two miles west to the museum. The meet is outside just west of the buildings. There are lots of motels and restaurants at Thruway Exit 49. Flea Market 8 a.m. to noon. Museum exhibits open at 11:30 (new display of early radio and broadcast artifacts). Bring items for the auction beginning at about 11 a.m. There will also be a donation auction—but no junk we can't sell please! Contest categories: 1. Any battery radio; 2. Any AC-powered radio; 3. Any crystal radio; 4. Any speaker; 5. Open category—any radio-related item. \$5.00 entry fee includes annual NFWA membership, museum admission, flea-market setup. No additional fees to sell or for any other activity. Free coffee and donuts. Lunch available. For info, call Larry Babcock at (716) 741-3082 or President Gary Parzy at (716) 668-2943.

AWA ANNUAL CONFERENCE



August 17-21

At Rochester Institute of Technology Conference Center (formerly Thruway Marriott). I-90 Exit 46 to I-390 North to NY 253 West to NY 15 South. RIT Info Number (585) 359-1800. **Also see CONFERENCE PREVIEW section in this issue.**

VRPS/AWA ANNUAL CONVENTION



November 12-14

This event celebrates Vintage Radio and Phonograph Society's 30th year. You'll enjoy three live auctions, three silent auctions, old equipment contest, technical sessions, a demonstration of an operating 1928 scanning disk TV, flea market, and awards banquet. There'll be door prizes and raffles, and all paid attendees will receive a very nice gift. Entertaining at the banquet will be the "Dallas Blend," a barbershop quartet from the internationally famous singing group *Vocal Majority*. During the concert Rick Wilkins, phonograph historian and collector, will record some of the songs using circa 1893 equipment. Convention hotel is The Hampton Inn and Suites, 1700 Rodeo Drive, Mesquite, TX 75149. Phone 1-800-hampton; mention VRPS and get the convention rate of \$69.00 per night.

AWA, INC MEMBERSHIP AND BOARD MEETING

November 14

AT RIT Conference Center (see above). Membership meeting at 11 a.m. All members welcome. Board meeting follows.



AWA MUSEUM MEMBERSHIP AND BOARD MEETING

November 14

Same location as above. Membership meeting (all members welcome), followed by board



meeting, begins at conclusion of AWA, Inc. board meeting.

Recurring Meetings & Events

•Antique Radio Collectors of Ohio—meets first Tuesday of each month at 2929 Hazelwood Ave., Dayton, OH (4 blocks east of Shroyer Rd. off Dorothy Lane) at 7 p.m. Also annual swap meet and show. Membership: \$10.00 per year. For more info, contact Karl Koogler: mail to above address; phone (937) 294-8960; e-mail KARLKRAD@GEMAIR.COM

Nominations for AWA Awards

It is time to nominate candidates for six prizes to be given at the Annual Conference.

The **AWA Houck Award for Documentation** goes to an AWA member who has written several original articles on radio development or history in *The OTB*, *AWA Review*, or other publication. (This can include a book on a related subject.)

The **AWA Houck Award for Preservation** is for a member who, through personal accomplishment, has acquired and preserved by documenting an outstanding collection of radio artifacts. Send your selection(s) to the Houck Awards Administrator, giving your reasons why the nominee(s) should receive the Award. The address: Barney Wooters, 8303 E. Mansfield Ave., Denver, CO 80237.

The **Bruce Kelley-OTB Award** is given to the member who publishes in *The OTB* an article judged to be the most outstanding, original, historical presentation of the award year. For this year, articles in the August and November 2003 and February and May 2004 issues will be considered. The articles must have been written specifically for publication in *The OTB*, not reprinted from other journals. All AWA members are eligible for this award except those on the Award Committee and the *OTB* Editor. Simply identify the article and the nominee, with reasons for your selection; send to committee chairman Bob Thomas, W3NE, 216 Sunrise Lane, Philadelphia, PA 19118.

The **J. Albert Moore award** is a newly-instituted companion to the Bruce Kelley-OTB Award. The award comes to us through The Antique Radio Club of America, which was merged into AWA a few years ago. It was originally given for the most outstanding article

(any category) contributed to the *ARCA Gazette* during the publication year. Though the award continues a memorial to Mr. Moore's contributions to ARCA, it has been re-oriented as a companion to the Bruce Kelley-OTB Award—honoring articles that do not fall into the historical category considered for the latter.

And so the Moore award will be given "... to the article, or series of articles, deemed to be the most outstanding of those dealing with radio hardware (radio sets, radio systems or components) printed in the *OTB* during the award year. Eligible articles include those dealing with troubleshooting, restoration, performance evaluation, identification methods, and history." For this year, articles in the August and November 2003 and February and May 2004 issues will be considered. All AWA members are eligible for this award except those on the Award Committee and the *OTB* Editor. Simply identify the article and the nominee, with reasons for your selection; send to committee chairman Thomas F. Peterson, Jr., 3060 Lander Rd., Cleveland, OH 44124.

The **Taylor Award**, in memory of John Taylor, RCA TV Developer, is for "preserving television history." Submissions are invited here, too, to Peter Yanczer, 835 Bricken Pl., Warson Woods, MO 63122.

The **Tyne Tube Award** is presented, in remembrance of Gerald F.J. Tyne, for contributions to preserving or documenting the history of tube technology. Nominations may be sent, with supporting reasons, to administrator Lauren Peckham, Box E, Breesport, NY 14816.

Please send nominations for all awards by July 21, 2004.

•California Historical Radio Society—For info on current meetings, call the CHRS hotline: (415) 821-9800.

•CARS, the Cincinnati Antique Radio Society—Meets on the third Wednesday of each month at The United Methodist Church, 7388 E. Kemper Rd. For more information contact Tina Hauke at (513) 247-9406.

•Carolinas Chapter of the AWA—Hosts four “mini-swap-meets” each year (in January, May, July and October) plus an annual conference, “Spring Meet in the Carolinas,” on the 4th weekend in March. Executive committee meets approximately quarterly. For more info, visit the web site at CC-AWA.ORG or contact Ron Lawrence, KC4YOY, Chapter President, P.O. Box 3015, Matthews, NC 28106-3015; phone (704) 289-1166; e-mail kc4yoy@trellis.net

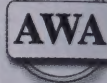
•Central Ohio Antique Radio Assn.—Meets at 7:30 p.m., third Wednesday of each month at Devry Institute of Technology, 1350 Alum Creek Rd., Columbus. (1-70 Exit 103B). Contact: Barry Gould (614) 777-8534.

•Delaware Valley Historic Radio Club—Meeting and auction begins 7:30 p.m. on the second Tuesday of each month. Location: Telford Community Center on Hamlin Ave. in Telford, PA. Annual dues: \$15.00, which includes a subscription to the club’s monthly newsletter *The Oscillator*. For more info contact Delaware Valley Historic Radio Club, P.O. Box 5053, New Britain, PA 18901. Phone (215) 345-4248.

•The Downer’s Grove (IL) Park District Museum sponsors a monthly “Collector’s Hour.” Participants have the opportunity to display collections at the facility for several weeks before making their individual presentations. The event is open to the public with no admission charge. The museum has also begun to sponsor a yearly “Collector’s Fair.” For more info, contact Mark Harmon, The Downer’s Grove Park District Museum, 831 Maple Ave., Downer’s Grove, IL, 630-963-1309, fax 630-963-0496, mharmon@xnet.com.

•Houston Vintage Radio Association (HVRA)—Meets monthly on the second Tuesday (April thru Oct) at Bayland Park, 6:30-9 PM

AWA LIFE MEMBERSHIPS ARE NOW AVAILABLE



Cost: \$400 (U.S.), \$500 (elsewhere). Send your check to AWA Secretary Joyce Peckham, Box E, Breesport, NY 14816. Phone (607) 739-5443. E-mail: awapecckham@aol.com.

in SW Houston. March and November meetings are held on Saturdays at the American Legion Hall off Alba Street in North Houston at 9 AM. Each meeting includes an auction and program. Two one day auctions are held each spring and fall. An annual convention is held in February. A newsletter, *The Grid Leak*, is published monthly. Membership is \$20/yr. Web site: www.HVRA.org. Write: HVRA, PO Box 31276, 77231-1276 or call Bill Werzner 713-721-2242 (e-mail: mingqi53@sbcglobal.net).

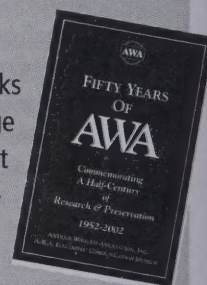
•Hudson Valley Antique Radio & Phono Society—Meets third Thursday of month, 7 p.m. Meeting, swap meet, and membership info: Peter DeAngelo, President, HARPS, 25 Co. Rt. 51, Campbell Hall, NY 10916. (914) 496-5130.

•Indiana Historical Radio Society—Meets quarterly in Feb., May, Aug or Sept and Oct. Flea market and Old Equipment Contest at all events. Auctions at all but Feb meet. The *IHRS Bulletin* has been published quarterly for the past 32 years. For meet details and information about the club and our Indiana Historic Radio Museum in Ligonier, IN see our Web site at www.indianahistoricalradio.org or contact Herman Gross, W9ITT, 1705 Gordon Dr., Kokomo, IN 46902-5977, (765) 459-8308, w9itt@mind-spring.com

•London Vintage Radio Club—This Ontario, Canada club meets in London on the first Saturday of January, March, May, June and November. Annual flea market held in Guelph, Ontario in September in conjunction with the Toronto club. Contact: Lloyd Swackhammer, VE3IIA, RR#2, Alma, Ontario, Canada N0B1A0. (519) 638-2827. E-mail contact is Nathan Luo at lvrceditor@yahoo.com.

50TH ANNIVERSARY COMMEMORATIVE BOOKLET

Our 50th anniversary commemorative booklet *Fifty Years of AWA* has received high marks from everyone who has seen it. We still have a stock of this profusely-illustrated 60-page AWA history available for those who would like extra copies or those who were not members at the time of distribution and didn’t receive one. Cost is \$7.00 per copy post-paid, no limit. But once they’re gone they’re gone—so act now if you are interested! Send your check to Joyce Peckham, Box E, Breesport, NY 14816.



With the Chapters

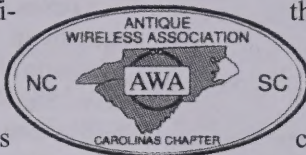
CC-AWA CHAPTER NEWS

On Sunday afternoon May 16th there was a much delayed CC-AWA Board of Directors meeting at the Sheraton Charlotte Airport Hotel. It can be a real challenge to find a date and time that suits everyone, so it was great to have all but one Board member present.

After some discussion of club finances and future event planning we moved on to the main topic, which was the updating of the club's by-laws. The present ones were written by the lawyer who handled our incorporation and are quite generic. Those of us involved with running the club have pretty much done whatever was necessary to carry out the job without paying a lot of attention to the by-laws.

In preparation for this meeting, we talked to a lot of members personally and also mailed a letter to every member asking for input. The general consensus is that the members mainly want to attend the radio meets we host throughout the year. They really aren't all that interested in how the club works just as long as we continue to provide the events.

We intend to make every effort to re-write the by-laws to reflect how the club actually works. More than two hours of the meeting were spent going over the proposed changes, most of which will be fairly transparent to the general membership. One of the major changes will be the adding of two more seats to the Board, making a total of seven. The seven



Board members and the Club's four officers will make up the Executive Committee, which will be responsible for the operation of the club. When the re-write is complete a copy will be mailed to every club member seeking their comments.

Judy and Barker Edwards have proposed that we publish a member's handbook that would contain, among other things, a copy of the new by-laws, contact information for all club officers and Board members, and a roster of all club members. I also hope, soon, to publish a pamphlet called "An Introduction to Radio Collecting." I think such a publication would go a long way to bring new people into this great hobby of ours. I'd also like to develop a program that would encourage young people to get interested in radio collecting.

Just look around at the next radio meet you attend and notice all the grey hair. You probably won't see many folks under forty and fewer still under thirty. There is concern about the future of Amateur Radio with so few young people entering the hobby. Radio collecting may be in even greater trouble.

The next event on the CC-AWA calendar is the Summer Swap Meet in Valdese, NC on Saturday morning July 31st. McGalliard Falls Park is a great site for a Saturday morning radio meet; this will be our second year at this location.

Ron Lawrence

CC-AWA President

•Mid-Atlantic Radio Club—Meets monthly, usually the third Sunday of the month at the New Hope Seventh Day Adventist Church, Burtonsville, MD. Contacts: President, Geoff Shearer, 14408 Brookmere Dr., Centreville, VA 20120, e-mail gshearer@cox.net; Membership Chair, Paul Farmer, (540) 987-8759, e-mail: oldradiotime@hotmail.com. Website www.maarc.org

•New Jersey Antique Radio Club—Meets second Friday each month, 7:30 p.m. Holds three annual swap meets. Contact (send SASE) Phil Vourtsis, 13 Cornell Pl., Manalapan, NJ 07726, (732) 446-2427.

•Northland Antique Radio Club—hosts four events with swap meets each year (in February, May, September and November) including an annual conference, "Radio Daze," for two days in mid-May. Annual dues are \$12.00, which in-

cludes a subscription to the club's quarterly newsletter. For more info, visit our web site at www.geocities.com/northland.geo/; contact Ed Ripley at (651) 457-0085; or write NARC, P.O. Box 18362, Minneapolis, MN 55418.

•Northwest Vintage Radio Society—Meets second Saturday of each month (except July and August), at or about 10 a.m., at Abemathy Grange Hall, 15745 S. Harley Ave., Oregon City, OR. Members display radios, exchange information. Guests welcome at all meetings and functions, except board meetings. For info, write the Society at P.O. Box 82379, Portland, Oregon 97282-0379.

•Oklahoma Vintage Radio Collectors—Oklahoma City Chapter meets second Saturday each month at Hometown Buffet, 3900 N.W. 63rd St., Oklahoma City, OK. Visitors welcome. Dinner/so-

AWA NETS

(EASTERN TIME)

PHONE

SUNDAY:

7237 kHz, SSB, noon (NCS:WA4IAM); 3837 kHz, AM 4:30 p.m. (NCSs: KA2J & W2AN)

TUESDAY:

14274 kHz, SSB, 2:30 p.m. (NCSs: KC3YE and W0FXV);
3837 kHz SSB, 8 p.m. (NCS: WB2SYQ)

MONDAY-WEDNESDAY-FRIDAY:

The AWA Bruce Kelley HF Net
3867 kHz, SSB, 9:30 a.m. (NCS: W2OBJ)

CW

DAILY, 4 p.m., 3588 or 7050 kHz. Protocol, informal. Check both frequencies for activity and join in, or call AWA de (your call) and see what you stir up. First WEDNESDAY of each month, 8 p.m., 7050 kHz

2-M REPEATER (Rochester Area)

MONDAY, 7:30 p.m. (NCS: K2GBR)
Receive 145.290 MHz / Transmit 144.690 MHz

Novak at 412-481-1563 or write to Karl Laurin, 8111 Sally, White Oak, PA 15131.

•Society for Preservation of Antique Radio Knowledge—Meets at 7:30 p.m. the second and fourth Tuesdays of each month in the party room at Cassano's Pizza Parlor, 1700 East Stroop Rd., Kettering, OH. Membership, \$18/year. Write SPARK Inc, P.O. Box 292111, Kettering, OH 45429; e-mail sparkinc@juno.com or call John Pansing at (937) 299-9570.

•Texas Antique Radio Club—Meets alternate months in Kyle and Shertz, TX. Contact: Ron Manning, President TARC, 133 East Huisache Ave., San Antonio, TX 78212. Phone (210) 734-6831; e-mail ronmeg@gateway.net; website www.gvtc.com/~edengel/TARC.htm

Service Sources Available

The AWA Source Sheet is a listing of parts suppliers and services for the radio collector. Cost: only a business-size self-addressed stamped envelope to AWA, Box E, Breesport, NY 14816.

AWA VHS Video Programs

The Antique Wireless Association has available several historical documentaries to loan to affiliated organizations for club meetings and programs. There is no charge for this service other than return mailing cost. For info on loan conditions, to make reservations, or just inquire, contact Ed Gable, Curator, AWA Electronic Communication Museum, 187 Lighthouse Rd., Hilton, NY 14468. The following are available:

V-2 — "Electrons on Parade." 18 min. 1938 movie made at RCA's Harrison Plant showing production lines with closeups showing receiving tubes, including a short sequence on transmitting tubes. (Very rare movie.)

V-4 — "The British Receiver." Documentary of the AWA/BVPS meet with visit to Marconi's Chelmsford plant, the British Science Museum, and ending with series of collectible British

(continued on page 15)

cializing, 6 p.m.; meeting at 7 p.m. Membership, \$12/yr., includes monthly *Broadcast News*. Info: SASE to OKVRC, P.O. Box 50625, Midwest City, OK 73140-5625; or contact Fred Karner at (405) 769-4656 or fkarnet@cox.net; or visit our web site at <http://members.cox.net/okvrc/>

•Ottawa Vintage Radio Club—Meets monthly (except June and July) in the Conference Room, *Ottawa Citizen*, 1101 Baxter Rd., Ottawa, Ontario, Canada. Contact: Lea Barker at (613) 829-1804 or check www.ovrc.org. Membership: \$10 Canadian/yr.

•Pittsburgh Antique Radio Society welcomes visitors to our Saturday flea market/contests in March, June, September, and December. An auction is included in September, and our annual luncheon/program is held the first Saturday in December. Our newsletter, *The Pittsburgh Oscillator*, is published quarterly. website: www.nb.net/~schaefer/pars.html For directions, specific dates, information call President Bonnie

ADDITIONAL LODGING AT THE CONFERENCE

While the RIT Conference Center is clearly the most convenient location, other accommodations are available in the immediate area. Among the possibilities are:

Country Inn and Suites: 585/486-9000

Days Inn: 585/334-9300

Fairfield Inn: 585/334-3350

Microtel: 585/334-3400

Red Roof Inn: 585/359-1100

Super 8: 585/359-1630

MUSEUM NEWS

Visit us on the Internet at <http://www.antiquewireless.org>

OFFICERS

Director

Thomas Peterson, Jr.

Secretary

Robert Perry W2T1X

Deputy Director

Allan Pellnat, KX2H

Treasurer

Stanley J. Avery, WM3D



MUSEUM TRUSTEES

Stanley J. Avery, WM3D

Dr. Thomas Ely, W2ODW

Ronald Frisbie*

Edward Gable, K2MP*

Prof. William Hopkins, AA2YV

Lauren Peckham*

Allan Pellnat, KX2H*

Robert Perry, W2T1X

Thomas Peterson, Jr.*

Ronald Roach, W2FUI

Ronald Walker, WA2TT

Morgan Wesson

**also on AWA Inc. Board of Directors*

MUSEUM CONTACT

For all inquiries about the Museum and its operation, contact Edward M. Gable, Curator, 187 Lighthouse Rd., Hilton, NY 14468. Phone: (585) 392-3088, e-mail: k2mp@eznet.net.

The AWA. Electronic Communication Museum is an IRS 501(c)3 charitable organization.

Greetings from your Museum crew. One of our top news items concerns the highly successful AWA Museum Spring Meet. A new indoor venue, expanded programming, and opening the event to the public and outside vendors all helped make this year's meet one of the best ever. There was a record breaking crowd, but the ample spaces of the Bloomfield Elementary school offered plenty of elbow room. Just around the corner from the Museum Annex grounds, where previous meets were held, the school provided protected environment away from the possibility of rain or cold.

This day started out nice and sunny, but by noon there were frightful rains and we were happy that the flea market, AWA sales table, AWA and member auctions, vendors and seminars were all out of the weather. Our attendees saw a mostly well organized and smooth flowing event unfolding for them as the day progressed. What they didn't see was the panic just a few days before when it was discovered that the school had far fewer tables available than were needed.

A call to local fire departments and churches brought a wonderful community response. The

RECENT MUSEUM DONORS

- ❖ Ralph Williams Estate ...Early HRO, SW-3s, nice Home brew RX
- ❖ Bruce MaclellanMIL Sig Gen, I-208
- ❖ Dave SampsonGR-603A
- ❖ Michael GlavichSylvania 4416, Westinghouse H86A
- ❖ Michael Buonaccorso ..Rolan 5C6, Early Hitachi Model 8
- ❖ Tom Roscia W2GIRDetrola Table set, Ansonia Reproducer, more..
- ❖ Curt DunnamGR650A Impedance Bridge
- ❖ Norman Riah (Estate) ..Heath SB-303, SB-401
- ❖ George MasnyMotorola HS-69
- ❖ L & J. PeckhamRCA Tube Advertising stand, four Philco Test items, TracFone, more...
- ❖ David Hassett K2SQI ...Early Heath V3 VTVM
- ❖ Ed Gable K2MPEarly Hy-Gain VHF HT, Lester/Lafayette VHF Converter, 300 NIB vacuum tubes
- ❖ Nick ManacoPeerless Reproducer, Heath tube Audio items
- ❖ David YouseMIL J-Box for GRC-46
- ❖ Jack Wenrich K2RYExide Battery jar, Weston Oak meter, Millen RF Amplifier, Stromberg 1B, service books, more...
- ❖ Don TaylorSuitcase-style cell phone

Museum crew then morphed into a moving and trucking company until the job of collecting the extra tables was done. We'll use this year's experience to make next year's event even better. Thanks also to Ron Frisbie and Ed Wingate for their wonderful and crowd pleasing presentations, as well as to Roy Wildermuth, W3RLW, and Duncan Brown, K2OEQ, for their RTTY demo. Look for more of Ray and Duncan's work as they prepare to build a GRC-64 shelter.

Mark your calendars now for the 2005 Spring Meet: same improved venue, same first Saturday in May. The Spring Meet always coincides with the season opening of the Museum and that happy period is again with us. I'm pleased to introduce a new museum guide, George Masny, KA2GPJ, of nearby Penfield, NY.

Thanks, always, to the donors of artifacts to the Museum. We are happy to receive a bequest from the Albert Nystrom estate of Tampa, Florida. Approximately 30 pieces of early radio sets, mostly Crosley, are now on their way to us. Mr. Nystrom, a long time AWA member, stipulated that the Museum receive his collection and that the estate pay for packing and shipping, a very generous contribution indeed.

Another exciting and unusual collection that your crew has to pick up next week is a gift from the State of New York. It is a cold-war era communications suite once used by the New York State Civil Defense, and is located in a bunker two floors under ground. This rare find includes equipment made by the Technical Material Corporation and looks almost unused. Housed in one tall rack with a separate operating console, the voice and RTTY system uses the very rare TMC GPR-92, a 591 SSB converter, a kW amp and many other items. The intent is to dismantle the system to remove it from the bunker, then re-assemble it at the Annex and restore it to working condition.

Another nifty item recently received was a Navy-style loose coupler. Not in the hands of a collector, it was found at a household sale. It's amazing that these things still show up, although with ever increasing rarity. Also given was a very early Hitachi transistor radio, very large table top style, hand soldered and featuring a SW band that went all the way up to 4 Mcs. Probably stretching the state of the art back then.

You can see that the Museum continues with its theme of electronic communication covering the telegraph period, wireless and radio, telephone, television and more. Yes, I'm putting away cell phones, too! Work has continued in the tube loft where tens of thousands of tubes await attention. Transmitting tubes are first, and

each gets sorted by type, tested on Tom Ely's BIG tube tester, inventoried, and packed away in a known location. This activity is slow because the working time window is short. The attic loft is too hot in summer time and too cold in winter.

Summer also brings the right conditions to maintain and fix up the three antennas located at W2AN/W2ICE. The big loop has survived the storms OK, but the 40 meter doublet has a broken ladder line needing attention. I hope you enjoy your summer. We all look forward to seeing you at the AWA Annual Convention on August 17-21. S'long from your Museum crew.

Ed Gable

Ed Gable, K2MP/W2AN
Museum Curator

SUMMARY OF MINUTES

*A.W.A. Electronic Communication Museum
Board of Trustees meeting, May 1, 2004*

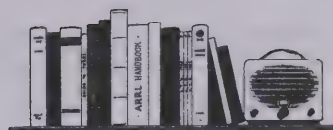
The meeting of the A.W.A. Electronic Communication Museum (AWAECM) Board of Trustees was called to order at 1:25 PM by Director Thomas Peterson Jr. The venue was the American Legion Post meeting room, Bloomfield, NY. In attendance were: T. Peterson, S. Avery, E. Gable, W. Hopkins, T. Ely, L. Peckham, A. Pellnat, R. Perry, R. Roach, R. Frisbie, R. Walker, M. Wesson. Director Peterson declared a quorum present.

Secretary Robert Perry reported that minutes for the previous meeting had been mailed to each Trustee. A copy of the current Museum Organization Chart was issued to each Trustee and will be filed with these minutes. Pellnat/Peckham moved to accept the minutes as published. Passed.

Treasurer Stan Avery issued copies of accounting reports generated by our accounting firm Heveron and Heveron. The reports consisted of the Balance Sheet and the Profit and Loss Statement of activities through the period November 2003 to April 2004. After discussion, the Treasurer was directed to request a Depreciation Schedule and that the accountants add CD Maturity dates and Percentages to the Balance Sheet. A copy of these reports will be filed with these minutes.

Deputy Director Alan Pellnat reported that activity in the "Adopt a Radio" program has been low but quality has been high. One radio is due back in August. Two of our leading restorers have been ill. We are putting restored radios on
(continued on page 15)

NEW BOOKS AND LITERATURE



DAVID W. KRAEUTER, 506 E. WHEELING ST., WASHINGTON PA 15301. E-MAIL: KRAEUTER@EARTHLINK.NET.
PLEASE INCLUDE SASE FOR REPLY.

Books to be reviewed in this column should be sent directly to David Kraeuter at the address above. After review, all such books become a permanent part of The AWA Library, which is part of The AWA Electronic Communication Museum and is available to members for browsing and research.

The Complete Jackson 648 Tube Tester Manual

By John Cross. Published 2004 by Vacuum Tubes, Inc. 407-481-9994, www.vacuumtubesinc.com, 8½ x 11 inches, 92 pages, softcover, \$24.00.

In the beginning there were books about radio, then there were books about radios. Soon there appeared books about test equipment, and now there are books about particular models of particular types of test equipment. Jackson tube tester owners take note: Cross' compilation of Jackson facts brings the relevant 648 documentation all together in one convenient place. Cross includes history and development, operating instructions, setups for antique tubes and radio restorers, and service information and schematics.

The main feature is a 55-page reproduction of the complete roll chart for the 648. Because the book is spiral bound and lies flat when open, the roll chart is very convenient to use. In Army basic training I was keen to avoid the dreaded "M14 thumb". Cross' inclusion of 648 roll chart settings allows users to avoid "roll-chart thumb". This feature alone makes the book worth purchasing. Recommended to all 648 users.



Oliver Heaviside: The Life, Work and Times of an Electrical Genius of the Victorian Age

By Paul J. Nahin. Published 2002 by Johns Hopkins University Press, www.press.jhu.edu, 7 x 10 inches, 318 pages, softcover, \$22.95.

I would love to have known Heaviside. He was an electrical and mathematical genius who at his death left five volumes of published writings which stand today as monuments in the histories of both mathematics and electromagnetics. He taught himself mathematics and electricity so thoroughly that people around the world wrote to him for advice, so much so that he became known in the scientific world as the "Inexhaustible Cavity." (On the other hand, Norbert Wiener once referred to him as "an undersized, hungry, deaf, cantankerous little electrician.")

To be sure, the genius was also human. He quit school for good at age 16 and at 24 quit the

only job he ever held and went home to live with his parents. When they died he lived alone, with less-than-adequate financial resources. He rarely left his house or neighborhood, but did enjoy bicycling. Possibly his only ride in a motor vehicle was the one which took him to a nursing home a few weeks before his death in 1925. And, if one of his last neighbors is to be believed, he was by then comfortable dressing in pale pink silk kimonos and painting his fingernails "a glistening cherry red".

Everyone knows Heaviside predicted what came to be called the Kennelly-Heaviside layer, known now as the E layer. But few know that Heaviside was also the inventor of the now-ubiquitous coax cable. This invention, the only one he actually bothered to patent (1880 British number 1,407) earned him the princely (and badly needed) sum of 100 pounds.

Another invention Heaviside should have patented and didn't was the long-distance telephone line loading coil. Money for that invention, about half a million dollars, went instead to Edwin Armstrong's mentor Michael Pupin, who did patent the device. (For more on this, see pages 29-31 of the November 2001 *OTB*.) Heaviside shared with Tesla an acute lack of business acumen. Or perhaps he simply didn't care about money.

He sprinkled his highly-technical writing with side comments on social or professional matters. Here he speculates on what today would be called psychophysics: "The fact that the brain is subject to material change and replacement during life does not debar the theory of partial dependence upon the inner world of the atom."¹ And on life in general: "Life is an essential property of matter. All matter is alive, even the deadest. All phenomena are natural phenomena."² Compare with Antony Flew's later, more cryptic, "...Stuff is all there is; while everything which is not stuff is nonsense"³.

This is the paperback version of Nahin's 1988 book *Oliver Heaviside: Sage in Solitude*, with a new preface by the author. Heaviside's seemingly-pedestrian life was a fascinating one, and

Nahin tells it very well and very knowledgeably. I can't imagine anyone starting to read this book and not finishing it.



The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century's Online Pioneers

By Tom Standage. Published 1999 by Orion Books Ltd, www.orionbooks.co.uk, available from amazon.com, 5 x 7¼ inches, 216 pages, softcover.

Likening the telegraph to the Internet is in some ways a stretch. For example, in the Victorian world telegraph messages generally went to just one recipient; today's spam was unknown. Few people owned their own equipment to access the telegraph system; today millions own computers that access the Internet. Video and audio components were unknown to telegraph users, but they are a big part of the Internet. But Standage's popular account of wire telegraphy is so engaging that the reader doesn't care about the differences between the telegraph and the Internet.

Of course, there were some obvious parallels. The telegraph and Internet alike were initially resisted by the public and thought of as toys. Then both systems were so thoroughly embraced by society that information overload became common. Victorian essayist Lytton Strachey described the telegraph as "that distressingly useful invention." Victorian architect William Morris declared that "for their brutalizing influence upon humanity telegraphs were as much to be blamed as were railways."⁴

Main telegraph lines in England became so clogged with messages that they were replaced with pneumatic tubes carrying messages on paper. Hence the recipient of a telegram in some cases received the actual paper form that the sender wrote upon. (Have any of these pneumatic lines been restored "just for fun"?)

Another parallel was the initial idealistic hope that each system would promote world peace. Standage says, "Given its potential to change the world, the telegraph was soon being hailed as a means of solving the world's problems." But neither the telegraph nor the Internet promoted peace, probably because both systems were used by human beings.

This book makes educational and entertaining reading.



Tickling the Crystal 2; Domestic British Crystal Sets of the 1920s

By Ian L. Sanders. Photography by Carl Glover. Published 2004 by BVWS Books, www.bvws.

org.uk, 8½ x 12 inches, 208 pages, hardcover, £29.95.

Volume two of Sanders and Glover is obviously done with the same loving care and attention to detail as the first. See page 63 of the February 2002 *OTB* for a review of volume one.

"A very good imitation of silence can be maintained in the wireless den." This sentence, from a 1924 letter to *Modern Wireless* (London) quoted in the book, is, I think, about as British as can be. So is the book, and we commend Glover again for his flawless photographs and Sanders for his meticulously detailed descriptions of British crystal sets, crystal wavemeters and "note magnifiers" (amplifiers).

Sanders says, "...new material on the subject continues to accumulate and the possibility of a third volume is under consideration." We say, "Bring it on."



Pioneers of Electrical Communication

By Rollo Appleyard. Published 1930 by Macmillan, currently available used from amazon.com, 5½ x 8½, 347 pages, hardcover.

These short biographical essays about Maxwell, Ampère, Volta, Wheatstone, Hertz, Oersted, Ohm, Heaviside, Chappe and Ronalds often include brief genealogies. Appleyard takes pains to show the frustrations and many false starts the pioneers experienced as they struggled to understand what could not be seen. He also frequently allows us to see the world as it was seen by the biographee.

Claude Chappe, who coined the word *telegraph*, was so stymied with his attempts to build a working electric telegraph that he completely abandoned it in favor of an optical (semaphore) system of signaling. That system ultimately encompassed 556 stations in France and was used throughout western Europe for the first half of the 19th century.

Ohm's law appears to us now as elegantly simple and obvious, yet to establish his work Georg Ohm struggled greatly against fuzzy definitions, unreliable instrumentation and simple human unwillingness to believe. He certainly could have made good use of a Fluke 177 with autorange.

We easily assume today that Ampère must have basked in glory with his invention of electrodynamics, but Appleyard tells us he may have been more interested in psychology and chess than in his electrical work. (I sometimes like to fantasize about Ohm (1789-1854), Ampère (1775-1836) and Volta (1745-1827) getting together on a Saturday afternoon in 1825 in a little

Swiss pub to “talk things over.”)

And what of poor, humble Francis Ronalds? In 1816 he designed and constructed a working electric telegraph—frequently cited as the first—but now he is known primarily for the telegraphy library that he assembled, today housed by the IEE.

Appleyard provides many other insights and bits of information relevant to telegraph history. The only price the reader must pay is tolerance of a distinctly Victorian style, syntax and pace. 📷

ALSO NOTED

Maxwell, James Clerk. *The Scientific Papers of James Clerk Maxwell*. Vols. I (607 pages) and II (806 pages). NY: Dover Publications, 2003.

- 1, 2. Both quotes from Appleyard, above, p. 255.
3. Antony Flew, *2,000 Years of Disbelief*, Prometheus Books, 1996, page 302.
4. Appleyard, page 331.

Correction for May column. In my review of David Sarnoff Research Center: RCA Labs to Sarnoff Corporation, the phrase in parenthesis in the first paragraph “now the David Sarnoff Research Center” should read instead “now the Sarnoff Corporation.”

AWA NEWS, continued from page 10

receivers. (VHS program transferred from slides.)

V-5 — “The Early Years.” Historical documentary narrated by Clarence Tuska telling of the early years of amateur radio, founding of the ARRL and WWI military radio training school. (VHS program transferred from slides.)

V-6 — “The Key.” History of the telegraph/radio key covering early hand keys, semi-automatics and commercial types. Script by Lou Moreau, W3WRE. (VHS program transferred from slides.)

V-9 — “The Transatlantic Tests and 1BCG.” Rare documentary/photographs showing early amateur operation leading to famous 1921

transatlantic tests.

V-12 — “Those Wonderful Magazine Covers.” The story of radio through magazine covers. Colorful with period music.

V-15 — “The WHAM Story.” Details development of a pioneer radio station in Rochester, NY. Program developed with assistance and recollections of Art Kelly, the station’s former general manager.

V-16 — “The Charles Herrold Story.” Video prepared by Mike Adams who donated this copy to the AWA. It documents the work of broadcasting’s Forgotten Father who started broadcasting in 1912. 📷

MUSEUM NEWS, continued from page 12

display in the Museum. Restoration guidelines have been developed as well as a list of potential restorer candidates. Alan will forward these to the secretary for distribution.

Curator Ed Gable presented a detailed written report (copy of which will be filed with these minutes) covering Museum activities, staff, budget, status of database, and buildings maintenance. Purchase of a DVD recorder/player is contemplated so that we can convert our slide/vhs programs to DVD format.

The Curator advised the Board of his possible retirement (or readjustment of duties?) in three years. A copy of Ed’s report was issued to all BOT members and a copy will be filed with these minutes along with the 2004 Staff roster and the budget report.

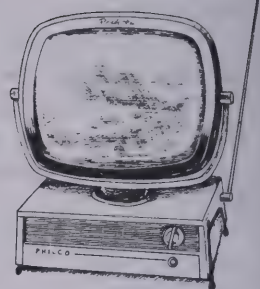
Morgan Wesson reported that the local cable company has approved the installation of a free drop for the Museum Annex coinciding with other community installations. We would still be responsible for ISP charges.

The Museum and AWA, Inc. Boards are still debating the best means for adjusting *Review* income. The Museum lease will expire in 2005; Director Peterson to contact Historical Society to discuss. The church next door to the Museum claims unwritten agreement re: parking lot lighting. Ed Gable to investigate and resolve. Bill Hopkins noted that the Board urgently needs a brainstorming session to discuss the museum future and funding.

Respectfully submitted,
Robert W. Perry, Secretary 📷

TELEVISION

EDITED BY **RICHARD BREWSTER**, 145 LITTLE PECONIC BAY ROAD,
CUTCHOGUE, NY 11935 PLEASE INCLUDE SASE FOR REPLY.



Columbia Is Telecasting!

This was the title of an article in the Sept.-Oct. 1931 issue of *Television News*, announcing the opening of experimental television station W2XAB on Tuesday, July 21st of that year. The transmitter and studio were located on the 23rd floor of the Columbia Broadcasting System Building, 485 Madison Avenue, New York City.

The television system used a 60 line, 20 frame per second (1200 rpm) mechanical scanning camera. The picture was broadcast on 2750 kHz with a power of 500 watts. Sound was separately transmitted on 6120 kHz.

The scanning, pickup, and transmission gear was supplied by RCA and installed by RCA engineers. One of them, the late John Paul Smith, was originally a GE engineer in Schenectady. I had the privilege of meeting him some years ago.

John explained that "We made three sets of this 60 line mechanical scanning equipment. This is the equipment that started CBS in TV broadcasting." He went on to say that the gear was built in the RCA development laboratory on the 6th floor of Building 2 in Camden, New Jersey. "In those days," John went on, "all the research, development, and production was done by the engineer. Technicians were not available

to do the dirty work."


The only power tool they had in their lab was a small drill press. They would drill the $\frac{3}{16}$ steel panels and carry them over to Building 8 to be sprayed black before being assembled and tested back in Building 2. In this manner, he and colleague J. M. Morgan built the racks of amplification and transmission equipment.

A Peerless arc projector provided a high-intensity light source that was directed through a 60-hole scanning disc and lens which was assembled by Merrill Trainer and Joe Briggs. (Amazingly, I have the same model Peerless projector which works together with a 60 hole Daven disc and a relatively modern Canon 50mm F 1.2 lens!) Trainer also supervised the construction of the photocell assembly. It was a copy of a design used by GE in their early TV tests in Schenectady.

Mayor Jimmy Walker inaugurated the official beginning of transmission as he lifted a curtain to expose the photocells. The photo shows Ms. Natalie Towers, the first woman to be signed exclusively for television appearance, in front of those photocells.

The Wellesley Magazine (April, 1931 issue) proudly noted that, "Perhaps our most nationally known member at the present moment is Natalie Burggraf Towers who has been the first person cast as a real type for television. Her picture has been published in 2000 newspapers. Natalie's story sounds like a novel. Before this offer came she has been living on \$ 0.10 a day, then was offered a \$500 a week job which she gave up for this regular radio broadcasting work."

Prior to the official opening of broadcasting, tests verified clear reception at such distant cities as Baltimore, Boston, and Schenectady. Once on the air, according to the *Television News* article, the station broadcast between the hours of 2 and 6 p.m and 8 and 11 p.m.

CBS Television has come a long way. In fact, some years ago they acquired my old company, Westinghouse. 



Natalie Towers with the Columbia telecasting "camera."

THE VACUUM TUBE



EDITED BY **LUDWELL A. SIBLEY**, 102 MCDONOUGH RD., GOLD HILL, OR 97525-9626

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Notes on Tube Bases

We're all familiar with the common bases used on tubes over the years. However, there are subtleties behind the designers' choices of base type and material. Here are some historical quirks that may be of interest.

Running out of Pins

When RCA introduced the octal base in 1935, it was felt that eight pins, plus possibly a top cap, would suffice for any reasonable tube design. However, even in the 1930s this number proved troublesome. At first the idea was that Pin 1 would be reserved for grounding the shell of a metal tube, and metal tubes were "all the rage" with RCA at the time. So when the design trend swung to single-ended metal tubes—6K7 to 6SK7, etc.—trouble came when the designers came up with a single-ended version of the 6K8 triode-hexode. (It would've probably become the "6SK8" if introduced.) Giving up the grid cap meant that, to save base pins, one side of the heater had to share a pin with the cathode. This wouldn't have been a disadvantage in automobile or transformer-operated radios, but would have been troublesome in AC-DC and other series-string applications.

History repeated itself in the late 1940s, when RCA designed a nine-pin miniature triode-hexode converter. Enough of the grids were pinned-out that it was necessary once again to tie the cathode to the heater. This tube also never got beyond the development stage, although a sample exists in a tube collection.

The conversion to glass-only octal tubes freed Pin 1 for other uses, as exemplified in the 6SN7GT and similar dual triodes with independent cathodes.

When Sylvania introduced its Loktal base, it got some extra pin capacity by using a combined shield-and-locating-key on the base. This gave, in effect, a ninth pin. The shielding effect was sufficient for most tubes, but the designer did commit a pin to an internal shield when necessary. In any event, 6SN7-oids like the 7N7 posed no problem pins-wise.

Novar vs. Magnoval Bases

The history of the large glass nine-pin base has some twists to it. Western Electric intro-

duced a new base format—nine pins of 0.050" diameter, in a 0.687" circle—in 1948. Tubes using it were the 418A, 429A, 436A, 437A, 448A, and 454A. RCA then brought out its "Novar" line of entertainment tubes in 1961, with the same pin circle but with skinny pins of 0.040" diameter.

To complete the story: in the same year that RCA introduced Novars, Amperex, the U.S. subsidiary of Philips, registered the EL500 TV sweep tube as the 6GB5. This brought back the Western Electric format with its 0.050" pins, under the name Magnoval. Other European Magnoval tubes that were registered here were the EL505 (6KG6), PL500 (27GB5), and PL509 (40KG6). RCA eventually had to add these four tubes to its product line for the replacement market, purchasing them from outside. It must've been irritating for them to have to adopt an alien format so close to their own!

Incidentally, many tube testers have Novar sockets to take the thin pins. Pushing a WE or Magnoval tube into them can spread the socket contacts and give miserable future reliability in testing Novars. In hope that this advice is not 30 years too late: if you can't find a now-rare Magnoval adapter, just hold the Magnoval tube gently against the socket, rocking slightly until contact is made all around, and the tube can be tested harmlessly.

Far-Away Bases With Strange-Sounding Names

RCA, as industry leader, had a habit of coining names for its new bases. In those days, Latin was commonly taught in high schools, so it was natural to use Latin numbers to reference the number of pins ("octal," "diheptal," etc.). However, as the number of base types grew with the proliferation of new tubes such as CRTs and photomultipliers, a thicket of prefixes and suffixes grew up: "sub," "neo," "ar," and "al." The use of Latin broke down as the pin count grew, and English roots were substituted—yielding such designations as "elevenar," "twentyinar," and "thirtyfivar." The variety of bases grew further when only some of the pin positions were

occupied. It sounds odd, but there had always been a "seven-pin octal" base; now there were types such as the "duodecal 5-pin."

The accompanying table lists RCA's main base names as well as tubes that used them. The rest of the industry went along with RCA's names, except for Western Electric, that perennial standoff. That company usually defined bases in terms of which WE socket would accept them, using no name at all.

Picture tubes were a major cause of diversity in base types, as shown by the double-fistful of adapters that used to come with CRT testers or rejuvenators.

Base Materials

The materials used for tube bases are of some interest. The usual choice was plain black Bakelite (or the competing Durez), containing wood flour as a filler. More elegant Isolantite ceramic appeared on the De Forest DV-DL line of tubes in the mid-'20s, not for any strong technical reason but giving "product differentiation." All-porcelain bases became important in the mid-

'30s; the Taylor line of transmitting tubes were handsome indeed, with their shiny hard-glass bulbs and glazed white bases.

However, RCA found a better material for most uses: tan mica-phenolic (Micanol), a version of Bakelite where the 40% wood flour was replaced with 65% powdered mica. (RCA promoted this idea internally as a great innovation, but this was actually the same stuff that had been introduced in National Co. coil forms several years earlier.) In any event, RCA tubes that had come out with porcelain bases (like the 807 and 809) soon got the new material. This occurred even though Micanol was considered "extremely difficult" to mold.

When tube makers put out a variant tube with a special base material, they could add an "X" or "Y" to the type identifier. "X" was reserved for "low-loss" materials having a loss factor of 0.035 maximum, while "Y" referred to an "intermediate-loss" material with loss factor of 0.1 maximum. (Alas, the frequency at which loss was measured was not defined!) In practice, "X"

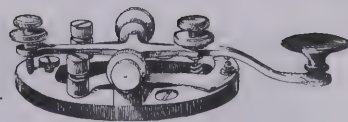
(continued on page 21)

RCA BASE NAMES

Bidecal 14-Pin (on 15GP22 pic tube)
 Bidecal 20-Pin (on 7850 photomultiplier)
 Diheptal 12-Pin (on 5527 iconoscope)
 Diheptal 14-Pin (on 3JP1 CRT)
 Diheptar 12-Pin (on 15LP22 pic tube)
 Ditetrar 8-Pin (on 7735 vidicon)
 Duodecal 5-Pin (on 16AP4 pic tube)
 Duodecal 6-Pin (on 7TP4 pic tube)
 Duodecal 7-Pin (on 10BP4 pic tube)
 Duodecal 10-Pin (on 6571 data-storage tube)
 Duodecal 12-Pin (on 2BP1 CRT)
 Duodecar 12-Pin ("Compactron")
 (on 6KD6 sweep tube)
 Eightar 7-Pin (on 21CEP4 pic tube)
 Elevenar 11-Pin (on 8072 beam power tube)
 Giant 5-Pin (on 803 power pentode)
 Giant 7-Pin (on 813 beam-power tube)
 Jumbo 4-Large Pin ("50-watter") (on 805 triode)
 Jumbo Annular 7-Pin (on 5820 image orthicon)
 Jumbo-Button Septar 7-Pin
 (on 7094 beam power tube)
 Jumboid 4-Pin (on 715C tetrode)
 Magnal 11-Pin (on 2AP1A CRT)
 Magnoval (on 6GB5 sweep tube)
 Neodiheptal 12-Pin (on 21AXP22 pic tube)

Neoditetrar 8-Pin (on 7183 storage CRT)
 Neoeightar 7-Pin (on 11GP4 pic tube)
 Neonoval 9-Pin (on 6GC5 power pentode)
 Neosubmagnal 11-Pin (on 7117 photomultiplier)
 Ninar 9-Pin (on 7764 photomultiplier)
 Noval 9-Pin (on 12AX7 duotriode)
 Novar 9-Pin (on 7868 pentode)
 RCA 21-Pin (on 4507 photomultiplier)
 Septar 5-Pin (on 4-65 power tetrode)
 Septar 7-Pin (on 826 power triode)
 Submagnal 11-Pin ("11-Pin octal")
 (on 931A photomult.)
 Super-Ditetrar 8-Pin (on 8051 vidicon)
 Super-Giant 5-Pin (on 4-1000 power tetrode)
 Super-Jumbo 4-Pin ("industrial") (on 579B rect.)
 Thirteenar 12-Lead (on 7767 photomultiplier)
 Thirtyfivar 21-Pin (on 7046 photomultiplier)
 Thirtyfivar 31-Pin (on 6866 storage CRT)
 Twelvar (Nuvistor) 5-Pin (on 6CW4 triode)
 Twelvar (Nuvistor) 6-Pin (on 8808 triode)
 Twelvar (Nuvistor) 7-Pin (on 6DV4 triode)
 Twentyninar 8-Pin (on 6499 storage tube)
 Twentyninar 22-Pin (on 6372 photomultiplier)
 Unidekar (on 1CP1 CRT)

KEY AND TELEGRAPH



EDITED BY **JOHN CASALE**, W2NI, 3 PICKERING LANE, TROY, NY 12180

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What Did a Railroad Telegrapher Do, Anyway?

By Carl G. Davis, W9CR
121 N. Scott St., Westville, IL 61883

Carl Davis, W9CR, provides us with his practical account of the various duties that were typically required of a railroad telegrapher. I would encourage other former telegraphers to consider documenting their experiences and submit them for publication as a "Key and Telegraph" article—John W2NI

I was one for about two years and I'll tell you about it. I started right after World War II when jobs were scarce. I saw an ad that the Chicago and Eastern Illinois (C&EI) railroad needed men to learn telegraphy and I signed up as a learner for \$0.40 an hour. My instructor was Jim Owens, bless his heart. He was an interesting guy and a lifelong telegrapher, but he had a hard time explaining things. It took him half an hour to tell me how to get to the outdoor john.

The code part was interesting. I had been a radio operator on merchant ships for four years and was pretty fast with CW (35 wpm), but it was very difficult switching from tones to clicks. Also, many of the letters and numbers were different. For example, the code for "L" in International Morse represents "X" in land line Morse. That character was used a lot, as in "X box" meaning an empty box car. Once I got on to it, I liked land line Morse better than International. It had fewer dashes and more dots—making it a lot faster, especially with a bug.

I enjoyed my apprenticeship, and Jim had many railroad stories to tell, so the time went by fast. We remained friends until he passed away at about age 60.

The interlock tower "WR" was in Westville IL, just a mile down the track. The interlock was between the Lyons yards, on the NYC line which ran from Chicago to Mt. Carmel, and the C&EI line from Danville to Villa Grove IL. The C&EI mainline went from Chicago to Danville and then on to Evansville, where it linked up with the L&N to Florida. The *Dixie Flyer* was a famous C&EI train.

The interlock was a mechanical monster.

About fifteen hand-operated levers actuated the semaphores and/or switches. These were about 100 yards from the tower and moved by one-inch iron pipes, so you were pulling a lot of iron when you pulled a lever.

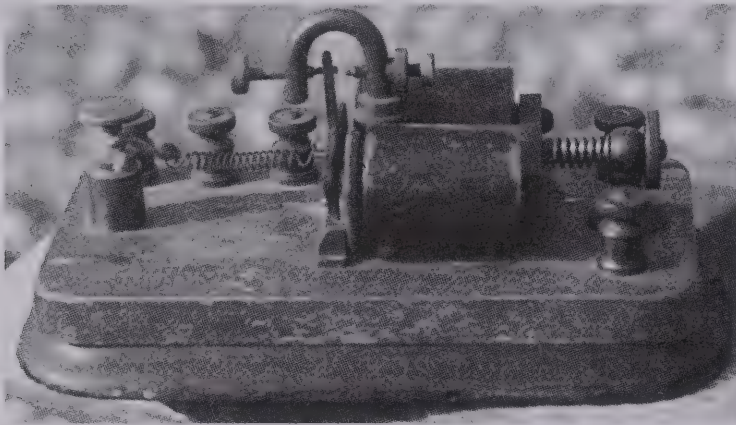
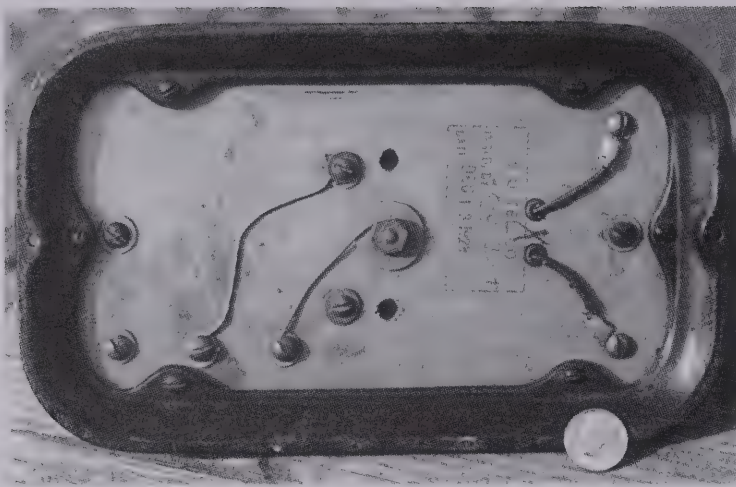
Our second-trick operator was about 70 and weighed not much more than 110 pounds. It was something to watch him pull those big levers; he had to throw his whole weight into it. The levers were not labeled, so you just had to know them. This was not a good system for learners.

One of my friends was sent to "Cory" tower near the Depot in Danville, a major railroad center. Cory was an interlock between the C&EI and the Norfolk and Western, and there were also several switchers working there. I observed at the tower a couple of nights and hoped that I would never be assigned work there.

There were no written instructions; you had to learn by doing and from the mistakes you made. He threw the wrong levers and the entire interlock system shut down. Two railroads were stopped for about an hour until they got the regular op to untie the mess. He said that when he got there the tower was full of red-faced engineers and my friend was literally running in circles. He was probably afraid for his life.

The C&EI had no idea of a proper training system, so all the interlocks were a challenge to newcomers. One of my fellow apprentices at "WR" forgot about one train and had two locomotives looking at each other, headlight to headlight. Up the tower came two exasperated engineers along with some brakemen. "WR" was within Lyons yard limits, so the block system was not used and they were therefore able to correct the error fairly easily. They figured how to get out of it as it was in yard limits so the block system was not used. So he got away with that one.

Another job at WR was to give train orders to a southbound freight and sometimes to a northbound passenger. These were handed to the brakeman on a "Y" shaped rod about 5 feet long. The orders were attached to a string at the top, and the brakeman could just manage to reach out and grab it. Jim had to do several of these each night.



The author obtained this relay when a station was closed and all of the telegraph equipment was junked. Large screw at right moved the electromagnet cores in and out, controlling the magnetic "pull." The screw adjustment on the left controlled the armature's spring tension, providing a finer adjustment.

The passenger train from Mount Carmel could be seen coming about two or three miles away because its light loomed over a slight hill. It was always on time but it was good to have the advance notice. The train passed through the railroad yard at 3 a.m., moving about 60 miles per hour. After that, Jim would curl up on a desk and go to sleep; there was no further work until 6 a.m. with the departure of a work train to two large mines.

I would stay up and watch the lights go on all over Westville as the coal miners got ready to catch the work train. The bell on a nearby Catholic Church would peal as I walked home in the morning along the track. Rung by old Lithuanian woman, it made a very pretty sound, especially over the snow in winter. Once home, I would sleep all day.

Jim never could explain the railroad "block system" to me, but somehow I got it figured out. The semaphores were kept red all the time. When the next station called and asked for a

clear block levers were thrown to set the semaphores straight up and change the light from red to green. As soon as the train went by, the dispatcher was notified and the semaphore was thrown to red again. This, of course, kept the trains from running into each other.

I understand that our standard time zones were created because of railroad needs. When every little town ran on its own sun time, there was a lot of room for schedule mixups. My dad's Hamilton railroad watch was his prized possession. Watches were checked by a time signal that came down the line at noon. I think it was similar to the BBC signal: six dots, with the last one being at noon exactly.

Jim told me they ran so many trains during the war that one dispatcher of his acquaintance had a nervous breakdown. Dispatchers had to keep in mind all of the trains in their division (about 200 miles of track). They also had to know all the sidetracks so that, as necessary, they could park one train to make way for another. A tough job.

Jim said there was one bad accident near Terre Haute about 1943, when a novice operator threw a green signal while a train was already in the single-track block. There was a head-on collision and many were killed.

A part-time operator from Western Union who worked second trick once in a while warned me that I should leave the railroad because the ops would be gone in a few years, and he was right. Central Traffic Control took over in about 1950. Then one man could watch a big board with lights showing every train, signal indication and side track, on 200 or more miles of railroad. So the telegraphers were slowly let go or given other jobs. One of my friends took a job as janitor, but he was able to keep his wage, seniority and pension. The company tried every trick to get him to quit, but he held on until retirement.

One of the last telegraph operators on the IC did get fired for wrecking a very large concrete bridge. It seems the IC had put in detectors at some stations to sense the heat or smoke emanating from a "hot box," or overheated axle bear-

ing. The bearing was contained in a box packed with cotton waste and oil. This op forgot to turn on the detector, and it missed a hot box. A few miles farther on, the axle and wheel froze and the car jumped the track, pulling a bunch of cars with it.

As fate would have it, this happened exactly underneath the only highway bridge in 20 miles. It was a very nice country bridge: "S" shaped, two lane, and with a high arch. It was a work of art, built during the Depression. The cars took out every pillar and the center collapsed. It took a year to replace it with an uglier but functional bridge.

Another op I knew worked a little block station on the C&EI route from Woodland Junction to Villa Grove. He fell asleep and forgot to pull the semaphore green for a very fast passenger train. It took the train about a mile to get stopped and he told me that when he saw the conductor slowly walking back to the station he felt like running away. So they had a little discussion and the train went on. So did the operator—to another railroad.

Curiously, this was the best thing that ever happened to him. He was not a good telegrapher, and when he went to another railroad in Chicago he got a desk job and ended up in a high position.

My first job on my own was as the operator/ticket agent at Villa Grove, IL. This was a terminal where trains got new orders, which I copied on the telegraph, not the phone. It was third trick in the summer and I had a hot little room and got very little sleep. That was a hard summer, 1946. There was also a long coal strike, and some passenger trains were canceled.


Part of my job was to copy long "consists," which are lists of all of the cars in a train, in order

and with their numbers. The consists are for the yardmen to use in switching operations after the train pulls in. I almost had a fight with one yardman when I messed up a consist. I also had to send consists to the dispatcher's office in Danville IL. They were experienced and very fast. Probably the farthest station I worked was 40 or 50 miles away.

I also had to sell tickets, about which I knew nothing, and receive copy from Western Union, again from very fast operators. When the receiving operator couldn't copy, he would signal that by "breaking," or opening the line, using the circuit-closing switch on the key. The transmitting operator often then got mad and began sending faster than ever.

When there was rain and all of the line insulators got wet, the wires became grounded. The telegraph signal got weak and the operator had to connect a relay and adjust it very carefully. Even using the relay it was sometimes difficult to get readable copy. Sometimes lightning would strike the wire or somewhere close to it and the line would go dead. The carbon rods used for fuses would then burn up and protect the equipment. These were up on the poles and had to be replaced by a lineman.

The batteries used were Edison cells, and the ones for the lights on distant semaphores were held in big locked boxes near the equipment. These were kept charged from the power lines. Current for the telegraph circuits was supplied the same way. Telegraph line voltage was probably less than 24.

The telegraph era was practically over by 1950, but all in all I found my work in this field to be a very interesting experience. 


VACUUM TUBE, *continued from page 18*

meant porcelain and "Y" meant Micanol.

In reality, special base materials were quite often needed in cases where superior moisture resistance was the deciding factor, and the high-frequency loss was irrelevant. The 5R4GY rectifier, common in airborne radars, had its Micanol base to keep the insulation from breaking down at high altitude, not for "loss" reasons. CRTs and phototubes had similar requirements as to moisture-induced leakage.

In the BC-221 series of frequency meters of WWII vintage, many models used a plain 6SJ7 as the audio amplifier, and a 6SJ7Y as the more critical oscillator. The 1626 high-stability oscil-

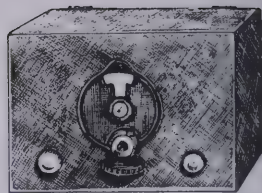
lator tube of AN/ARC-5 fame got its stability from a special brace on the grid rods and a Micanol base.

The black Bakelite used for other bases was not all the same grade. For home picture tubes with high voltages on their pins, a grade of compound with extra-high DC resistance was required. There was some use of melamine plastic on special-purpose tubes, but its high shrinkage on aging limited its popularity. For phototubes, Plaskon alkyd resin displaced Micanol to some degree, despite being brittle. Later on, diallyl phthalate was used for the low-leakage base on, for example, RCA's 4818 photomultiplier. 

AMATEUR RADIO

EDITED BY **JOHN F. ROLLINS, W1FPZ**, HC 33, BOX 150, ARROWSIC, MAINE 04530

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2004 O.T. DX Contest Results

Crowded band conditions and lots of "visitors"

A total of twenty nine AWA stations sent in logs for this year's O.T. DX contest, with two AWA stations that were logged by various participants absent from the final score sheet tally. Please remember to send in your logs so that you can be counted. I received a number of wonderful photos of homebrew gear that really show off the craftsmanship of this group. Special thanks to Ron, W0NYQ, who sent in a great series of shots. Fifties-era gear and homebrew circuits continue to be the mainstays of the event. As with some of you, the 1950s will always be my "magic" time.

The Cowboys on TV never swore and always rescued the girl in the end. We played softball by train stations that still served a few passengers and hung mailbags out for the express trains to catch. Hunkered down under the covers, we listened to crystal radios at night, built by dads who seemed to know how to do everything. The world was changing, but that's not how it seemed to a kid. We thought the fifties would go on forever.

This year, band conditions were crowded and seriously affected by signal fading and natural interference. Contacts seem to have been a little more difficult to come by. I would like to pass along a reminder from William, N9TT in that regard. Much of our 40s and 50s equipment is crystal controlled, with some fellows having only one or two crystals that operate in our contest subbands. This creates a need to use the same tuning methods that were common in those decades.

After calling CQ AWA, please tune your receiver up and down 5-10 kHz or more to receive answers from those who are "rockbound." This will also take care of any inaccuracies in receiver dial calibration. Some people, like me, frustrated at calling stations only two kHz away and not getting an answer, invest in a "spread" of crystals, spaced two KC apart for the segments of the bands that we use.

This should be unnecessary, though, if participants would tune "vintage style." In a future

column, I will describe the low power crystal-frequency spotter that I use to calibrate my receiver during AWA events.

Each year, I notice a few more "visitors" who stop in to see what we are doing. When a non-AWA station contacts you, take a few minutes to tell them about us and maybe send him an application. I sent out four applications along with QSL cards and will continue the practice next year. If you convince even one person to join up, it will have been worth it.

Encourage younger operators to join in the fun; they are our future. The AWA exists to keep radio history alive. We, the amateurs of AWA, are the foremost practitioners of the historic technology that gave birth to the era that we now live in.

Due to the type of log I sent out, several of you listed only your total number of QSOs. I did my best to figure out your scores based on descriptions of the equipment you were using. Some of you who did calculate scores shortchanged yourselves so I recalculated for you. Currently there are four AWA on-air events each year. The only one to use the number of QSOs as the score is the 1929 QSO party. With the others, you compute a number of points per QSO based on your power, equipment and location relative to the other station. As with the last two years' events, Sven Hed, SM4DIG held up the DX end of the contest, providing overseas contacts for the rest of us.

High scorer for the event was Bob Lundstrom, K1FI with a total of 227 points. He was followed by a western zone station: Harold Borchers, KB0ROB, who racked up 195 points. Congratulations on a job well done! I heard from several of you who were not able to make any contacts due to poor band conditions. I know how you feel. I diligently tried to make a contact in the 1929 QSO party last fall and did not get one station. Of course my feed line had broken and my "antenna" was a two inch deep puddle of water that the broken end had fallen into. So it goes here in Podunk.

Here is a breakdown of the scores:

BY **RANDY HAUS, KB2PLW**, P.O. BOX 665, TRUMANSBURG, NY 14886

EASTERN ZONE

| Station | Points | TX | RX |
|---------|--------|--------------------|--------------------|
| W1DDW | 7 | Mod Mod | |
| K1FI | 227 | 1946 Collins | 1946 Collins |
| W1FPZ | 99 | 1934 Homebrew | 1954 Collins |
| W1TSP | 69 | 1942 BC459 | 1946 HQ129X |
| NV1X | 28 | Mod 1938 | NC101X |
| W1YT | 58 | 1959 2E26 HB | 1965 Drake (Mod) |
| KB2E | 15 | 1959 Hallicrafters | 1955 Hallicrafters |
| K2KK | 36 | 1955 Johnson | 1960 Hallicrafters |
| W2LID | 4 | Mod | Mod |
| KE2O | 28 | 1940s 6L6 Xtal | Mod |
| KB2PLW | 115 | 1937 "Rollins HB" | 1943 BC348 |
| W2NI | 180 | 1953 Collins 32V3 | 1955 Collins 75A4 |
| W2RS | 120 | 1954 Johnson | 1958 Collins 75S1 |
| W3VVS | 4 | Mod | Mod |
| WA4IAM | 174 | 1954 Millen 90801 | 1955 Collins 75A4 |
| W2CQH/4 | 2 | Mod | Mod |
| W4FRM | 0 | AWA ListeningPost | 1941 BC312 |
| KJ8L | 45 | 1954 CE 10B | 1950 Hammarlund |
| AA9DH | 0 | 1957 Heathkit | 1945 Hammarlund |
| N9TT | 18 | 1956 Knight T50 | 1956 SX101 |

WESTERN ZONE

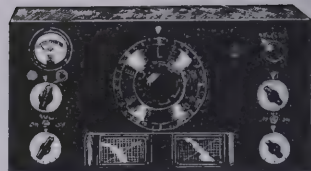
| Station | Points | TX | RX |
|---------|--------|---------------------|--------------------|
| K5RB | 22 | 1939 Osc. | 1936 SW3 |
| K6TQ | 144 | 1938 6L6/807 | 1936 National HRO |
| W6TDP | 30 | 1953 Elmac AF67 | 1938 Hammarlund |
| W7LNG | 92 | 1955 Johnson Ranger | Mod |
| W8KGI/7 | 6 | 1951 32V3 | 1955 Collins |
| W7LOG | 12 | 1952 Heath VF1 | 1938 Hammarlund |
| KB0ROB | 195 | 1936 Homebrew | 1955 Hallicrafters |
| W0NYQ | 150 | 1958 Heathkit | 1938 Hammarlund |

DX ZONE

| Station | Points | TX | RX |
|---------|--------|--------------------|----------------------|
| SM4DIG* | 144 | 1959 Hallicrafters | 1957 National HRO 60 |

*We received a "30s night" log from Sven too late to include in the May Amateur Radio column. Bob, K1FI, was lucky enough to be his single contact. The QSO was on 20 meters, with Sven using a National NCX-5 and NCL2000 PA; Bob running 75 watts operating unspecified 1946 equipment. Bob doesn't seem to have sent us a log.

THE COMMUNICATIONS RECEIVER



EDITED BY **WILLIAM FIZETTE, W2DGB**, RR 1, BOX 1634, HENRYVILLE, PA 18332
PLEASE INCLUDE SASE FOR REPLY.

The Howard 438

By Jim Hanlon, W8GKI

I wonder how many of our readers have actually used one of the Howard Radio Company communication receivers from the 1930s-1940s era, a time that many consider the "Golden Age" of radio. While I have a few of those radios, I must admit that I never had worked on one until this article surfaced and I decided to restore a Howard for an upcoming "Fixing Up" column. Read on, while author Jim Hanlon tells the story of his receiver.—W2DGB

I did not start out to become a collector of communications receivers; it just sort of happened. My father bought a wonderful HRO-50 for my older brother and myself back in 1950, when we were getting interested in ham radio. I didn't acquire another receiver (outside of some WWII surplus Command Sets that don't really count because they only cost about five bucks apiece, and everyone had at least a few) until 1965. By then, I was married, the father of two girls, in graduate school, and teaching at Ohio State. That year Bob Higgy, W8IB, a professor friend of mine, gave me his HRO Senior "to take care of for him" when I helped him move his ham gear out of his ancestral home to an apartment. Bob knew that I understood HROs, and that I would appreciate his radio and put it to good use in my hamshack.

The first time I actually "collected" a receiver occurred at Dayton in 1978. It was my first-ever visit to the Hamvention, and in a cruise around the flea market, a somewhat familiar item from my Boy Scout days caught my eye. Back around 1953 when I was WN4VIV in Kentucky, one of the guys in my troop, realizing my great expertise because I had a Novice ham license, brought me a non-working Howard 435A and asked me to fix it. Even at that age I had the right combination of luck and insight to find the trouble with his set. All of the antenna input coils were burned to nothing but black traces on the coil forms. To this day I wonder what happened to cause that catastrophe. Was there a nearby

lightning strike, or did a previous owner try to tie in the 110 volt line to the antenna terminals?

Whatever the cause, rewinding new antenna coils onto the scorched grooves brought the little radio back to life. My scouting buddy played with it for a while and then lost interest, so about a year later I talked him into selling it to another friend who was in my Radio Club at Saint Xavier High School in Cincinnati. John "Mac" MacAulay, then WN8SBW, later K4AWW, and now WQ8U had just gotten his Novice ticket. He paired the Howard with a Heath AT-1 and had a nice little station on the air.

What had caught my eye at Dayton was the familiar black box of a Howard receiver, this time a model 438. An older gentleman, Bob Blum, ex-W8DDI from Bucyrus, Ohio, was offering it for sale. "It covers 160 meters," he assured me in an attempt to make it more attractive, "and it comes with its original manual." A few minutes later we had agreed on a twenty-dollar price and I had crossed the threshold to becoming a collector.

The Howard Radio Company, according to Raymond Moore in his book, "Communications Receivers," was based in Chicago and was a long-time manufacturer of broadcast receivers. From 1938 to 1942 the firm offered a line of communications re-



The W8GKI Howard Model 438 receiver as restored to operating condition.

A CHRISTMAS TRIP TO CORTLANDT STREET



Reprinted from "Mel's Corner" in The Antique Radio Gazette¹ Volume 19, No. 4 (Winter, 1991)

A few days before Christmas, some time in the early 1920s, my grandfather escorted me from my home in West Orange, New Jersey to that fabulous radio market in New York City known as Cortlandt Street. Even then, the area was well known for its many radio shops selling new, used and surplus equipment. The radio craze had just exploded, and radio was soon to become a household word.

Before then, radio was in the hands of professionals, the occasional tinkerer picking up local stations on his crystal set, and radio hams transmitting with their a spark rigs. The latter were well on their way to making developments that would lead to the replacement of spark with continuous wave signals generated by tubes.

But by the time of our Cortlandt Street trip, rooftops in residential areas had sprouted all kinds of wires and insulators—some with BIG lightning switches for grounding during a electrical storms. Four-wire flat-top antennas with spreaders could be seen looking in every direction! The longer and higher ones promised the best results.

The roofs of multi-tenant apartment houses became tangled masses of confusion. Wires crossed everywhere. Some were shorted or torn away, leading to heated discussions among their owners. And more and more antennas were appearing every day.

Inexpensive crystal sets were the order of the day. Factory-made ones were available, but "Make Your Own Radio" articles appeared in newspapers and magazines everywhere. You wound your own coils, found a chunk of galena and a fine wire "cat's whisker," and put up a nice long antenna (or "aerial" as it was usually called).

It was a bonanza for the radio shops of the day, who packaged exotic minerals in small round wood boxes bearing names such as "Xtra Loud Sens Crystal," "Death Valley Crystal" (a popular one!) "Du-Tec Xtal by Dubilier," "Foote's Pyrite," and "Silicon by Bunnell". Cat's whiskers came packaged in small glass tubes, some labeled "Super-Fine." All collector's items today.

The crystal set required endless probing with that fine-wire cat's whisker to find a sensitive

spot on the galena. Imagine what a boon it was to the listener when vacuum tube detectors came into common use.

In some areas, nearby high powered commercial spark stations would come blasting in, sending high-speed code generally unintelligible to the listener. Some manufacturers offered wave-traps to tune out the offending signals. Some were effective, but if you lived next door to a spark station—OUCH!!!

Later in the era, table sets using tubes appeared. Housed in furniture cabinets, the easy-to-tune radios were ready to go at the flick of a switch. Now you could concentrate on trying to pick up news and entertainment from the few broadcast stations existing then.

Conversations with neighbors were often full of such questions as "How far did you get last night?" "Did you hear KDKA Pittsburgh?" "Philadelphia?" "Chicago?" "Ever get Des Moines, Iowa? Boy!!-that one was a doozy to add to the list!" The "DX bugs" were always trying, buying, experimenting—anything to improve reception.

Radio advertisements featured call letters of stations from hard-to-get localities in order to highlight the qualities of the sets being offered. "East coasters—can you get California?" (Always the big come-on.) Dig deeper—in your pockets! Let's go!

Anyway, there we were on Cortlandt Street. At the far end, near the river, we came to a store so loaded inside that the sidewalk was piled high with the spillover—mostly junked marine sets. Take your pick for a few bucks and haul it away! Wireless Specialty! Amrad! National Electric!, the IP's!— all with those beautiful shiny nickel dials, multiple switch taps, detector units. The ones that had missing parts or were bashed up were really dirt cheap.

There seemed to be little interest in these government-surplus long-wave receivers—just a few fellows salvaging parts. Picked-over carcasses were often pushed out to the gutter for the trash man to dispose of. Imagine if a place like this existed TODAY!!

Now we rounded the corner to Fulton Street. Here at number 45 we found the world-famous Electro Importing Company, with Hugo Gernsback presiding! Inside was shelf after shelf of

beautiful, well-organized equipment. Sophisticated clerks waited behind the counters to explain the features and operation of the gear.

Adjacent to this store building was the laboratory of Mr. McCandless, who manufactured de Forest's spherical Audions. When the E. I. Company came out with their early spherical Audion control unit, purchasers could just run next door to pick up a tube. However, this was a dying market because the new Radiotron UV-200 detector tube had been introduced. But as we poked around in the E. I. Store, we saw several of the wood-based spherical Audion control units tucked and forgotten in a remote corner. The highlight of my day came when Grandpop purchased a brand new E. I. loose coupler as my Christmas present!

Further up Cortlandt Street, there were no end of famous radio stores—Davega and many others—all displaying beautiful cabinet radios in their windows. Many of them featured the new

UV-200. But I wondered who would want to pay those fabulous prices when the real fun and joy was came from building your own set.

Traveling back across the Hudson River towards home, I happily clutched my E.I. Co. package along with the latest issue of *Radio News*. What fun it was then to build up those early sets from scratch! ☐

NOTE

¹ *The Antique Radio Gazette* was the official publication of the Antique Radio Club of America. ARCA merged with The Antique Wireless Association in the spring of 1994, and the content that appeared in the *Gazette* during its 1972-1994 publishing history is now part of the AWA archives. Though edited to conform to *The OTB's* current standards of style, this article appears essentially as originally published.

COMMUNICATIONS RECEIVER, continued from page 25

though I usually warm it up for half an hour or more before I use it on the Classic Exchange. (*The Classic Exchange is a February operating event, open to all, encouraging the use of "golden oldie" ham rigs. For more information, visit <http://qsl.asti.com/CX/>—ed.*)

Howard Radio went on in 1940 to offer a rather imaginative "progressive line" of receivers that may have had more appeal to cash-strapped hams of the era. The basic model 435A was a seven-tube superhet, selling for \$36.75, with one r.f. and one i.f. amplifier. It could be returned to the factory and, at a cost of \$12.75, upgraded to a 436A. This added a noise limiter, a "new, eight-inch bandspread micrometer dial, and the exclusive new HOWARD INERTIAL KNOBS."

For another \$17.05, you could send in your 436A to be upgraded to a 437A. The radio would come back to you with a second stage of IF and a crystal filter. Other available accessories were an S-meter, an external preselector with two stages of r.f. amplification and a directional loop antenna, a monitor that "assures exact frequency measurements on all amateur bands," and an external speaker.

The original, non-A versions of these receivers did not include an r.f. stage, at least in the 435 and 436 models. I have a 436A, and the r.f. stage is indeed in there but it looks like it was tacked on afterwards rather than designed in from the outset.

Howard offered a full line of radios through 1941, all the way up to the Model 490 (similar electrically to the Hallicrafters SX-28 or the Hammarlund Super Pro). You can view pictures of quite a few of their offerings and find schematics for them at <http://members.cox.net/n7rk/howard.htm>. Dur-

A vintage advertisement for the Howard Model 438 radio. The central image shows a dark-colored radio with a large, multi-scale dial and several control knobs. Above the radio, several callout boxes point to specific features: 'CRYSTAL FILTER', 'ELECTRIC BAND SPREAD', 'R.F. ON ALL BANDS', and 'CERAMIC COIL FORMS'. Below the radio, text reads '4 BANDS—8 TUBES BUILT-IN SPEAKER'. To the right, a circular badge contains the text 'Model 438 Only \$49.95 less crystal'. At the bottom, the slogan 'HOWARD DOES IT AGAIN!' is printed in large, bold, capital letters.

Detail from Model 438 announcement ad. From 1938 Radio Amateur Callbook.

ing the war Howard actually built Super Pros; you will find a few around with Howard on the nameplate rather than Hammarlund. I was told by a friend who was a radio op during the war that when they got a Howard Super Pro they assigned it to the Commanding Officer as an entertainment radio instead of using it for serious communications duties. It wasn't the solid radio that Hammarlund built even if it looked the same. Howard Radio disappeared from the communications receiver business after the war.

Old Howards still show up occasionally at flea markets or on the Internet swap sites. In general they are not as well built as their Hallicrafters, National, or Hammarlund contemporaries, but they are still a lot of fun to restore and use, and their non-glamorous status makes them more affordable. They are definitely worth adding to your collection. ☐

MICS AND MEN

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PLEASE INCLUDE SASE FOR REPLY.



The Mic: AKG D202 The Man: John A. Gambling

The world of broadcasting can be quite small. For example, John A. Gambling, well known for his “Rambling With Gambling” show, joined WOR in New York (Buckley Broadcasting) in 1959. I joined Buckley at WDRC in Hartford, CT that same year.

Station WOR first signed on Feb. 22, 1922. It is now the last station with a three-letter call in New York City. Gambling’s grandfather, John B. Gambling, was working at the station in 1924 when it was used by its owner, Bamberger’s Department Store, to sell radios. John B. entertained listeners for well over 30 years. After he retired, his son John A. did the morning “Rambling with Gambling” show six days a week for over 30 years. He turned the program over to his son, John R. Gambling, in the early 1990s. These three generations of Gamblings served WOR listeners for 75 years.

The microphone being used by John A. in the picture is an AKG D202. Introduced in 1966, it was nicknamed “Sound-Rocket.” The Austrian AKG acronym stands for Akustische u. Kino-Geräte. Translated, the name becomes “Acoustic and Cinematography Equipment.” AKG was started right after World War II by Dr. Rudolf Göerike and Ernst Pless.

The D202, is “moving


coil” microphone, meaning that it contains a diaphragm with a coil placed in a magnetic field. Actually, the D202 introduced “two-way technology,” containing one element for the low frequencies and another for the highs.

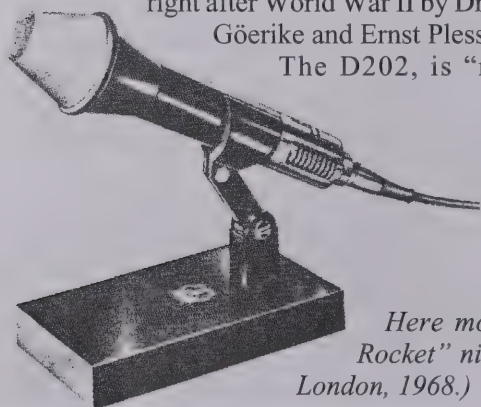
The microphone presents a unique appearance



John A Gambling broadcasting with an AKG D202. (From Rambling with Gambling by J. Gambling, Prentice Hall, 1972.)

with its “funnel-figure sinter cap.” As I recall, the cap on the version I own feels like hard Styrofoam. The unit is uni-directional and frequency response was specified as 20 to 20,000 hz. A 1979 catalog listed the price as DM 415 or approximately \$225.00 using the exchange rate at the time. This is well over \$600.00 in today’s money.

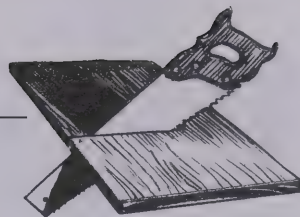
The theme of our annual AWA Conference theme this year is “Broadcasting,” so the old equipment contest includes a “microphones” category. So be sure to bring your favorite mic and accompanying documentation. I’ll be looking for you in the contest room! 



Here mounted on a desk stand, the D202 lives up to its “Sound Rocket” nickname. (From Hi-Fi Yearbook, Henslow Year Books Ltd., London, 1968.)

BREADBOARDING

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*Bring Historical Circuits to Life
On Your Workbench!*

Winter Madness—Creating a Radiola 18-S

Here in the DC suburbs we had a nasty snowstorm one February. Housebound for several days, and having just restored a Radiola 18, I looked around for something to do. There was a leftover chassis and a very shabby extra cabinet for the model 18, and it occurred to me that, Frankenstein-like, I could bring it new life. I thought: “What if I could make this extra chassis into a superhet and put it back into the extra cabinet?” I guess you could call it an extreme breadboard project.

The Radiola 16, 17 and 18 TRF models were introduced in 1927, a year before RCA began selling mass-market superhets. The Radiola 16 is a six-tube battery set. The 17 is a straightforward receiver using six a.c. tubes, plus one 80 in a separate power pack. The 18 is just like the 17, except the RF stages are neutralized.

I thought about how to achieve the typical superheterodyne circuit using six tubes and a rectifier. Lacking the original power supply, I had no filament transformer that would light the original 26s and 27. Considering tubes that would be both convenient to heat up and fit the original sockets, I figured to use two-volt battery RF tubes and (as in the original) a heater-type tube for the detector. I’d keep the original 71-A output tube.

The tube lineup I decided on was: Oscillator-30; mixer/1st detector-32; i.f. stage-32; detector-37; audio driver-30; audio output-71A. Of course I’d also need a rectifier tube, and eventually decided on a 6X5.

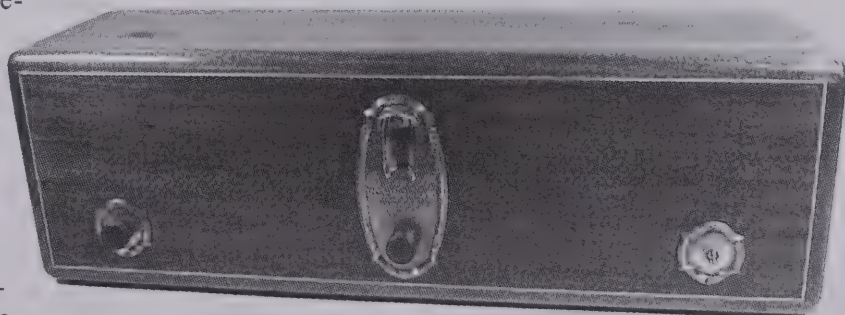
I left the design of the new power supply for last, keeping in mind that it would have to deliver high voltage of +180 plus various low voltages for the receiver filaments. For convenience these would all be d.c., though the 37 and 71-

A could have run on a.c. I’d also need negative bias voltages (-13 and -30 volts) for the audio tubes.

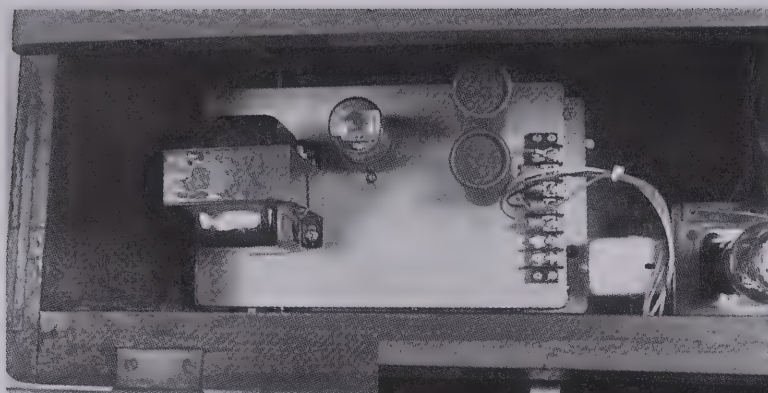
I began by stripping down the chassis to the tuning cap, tube socket deck, and two potted blocks. One of these held four bypass caps; the other two audio transformers (one bad). First thing to do was to replace the bad transformer, so I melted it out using a heat gun and found a replacement that would fit the case in my junk box. The case then got filled back up with most of the pitch. The four bypass caps measured about 2 μ f each and were pretty leaky, so I decided to use those only for low-voltage applications.

In restoring my first model 18, I had found I needed to modify the tuning range of the set; according to the label on the bottom of the cabinet, it would originally tune only from 540 to 1400 KC, and I wanted to get the top end up around 1500 KC at least. Removing two plates from each stator section of the three-gang tuning cap did the trick.

I knew the superhet version would need even more drastic changes to make the oscillator and RF stages track together with a 455 Kc offset all the way through. So first I breadboarded the oscillator stage. A P-C70-OSC coil from AES fit into a small can from the junk box, and by adjusting the little ferrite core inside and removing a total of four plates from the end section of the tuning cap, the 30 triode could be made to tune



Outwardly, my “Radiola 18-S” looks just like a stock Radiola 18.



Looking from left to right, the tubes on the receiver chassis are a 30 oscillator, 32 mixer, 32 i.f., 37 detector, 30 audio driver, and 71A power output.

Below: The replacement power supply delivers plate, bias, and d.c. filament voltages.

from 1025 to beyond 1955 Kc, enough to get all my local stations.

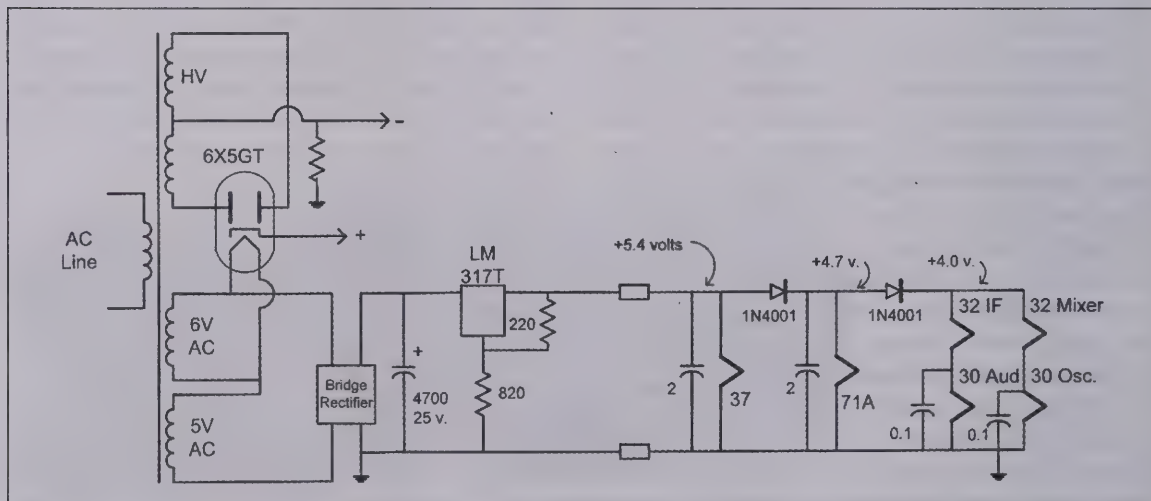
In the photo of the receiver chassis, the oscillator section of the main tuning capacitor can be seen at left. There are only five plates left on the stator. Notice the trimmer cap I installed to tweak oscillator tuning at the high end of the range. The right section of the tuning capacitor was not used and you'll notice that its stator has been removed. The center section, with a couple of plates removed, is used with one of the original coils for r.f. tuning.

The signal from the local oscillator gets fed to the screen of the mixer tube through a 30 pF capacitor. In developing the rest of the circuit, I basically breadboarded as I went, referring to the tube manual and using a decade resistance wheel to help determine resistor values. I salvaged 455-kHz i.f. transformers from another junk radio. The original volume control was left in place; it is wired across the antenna to ground, and its wiper connects right to the control grid of the mixer tube. I removed the "0-100" dial scale

from the tuning drum and made a new one directly calibrated in frequency.

I'm including a partial schematic of the power supply showing how the filament voltages were derived from a +6 volt regulator chip. A universal power transformer was used, and an output transformer was installed on the chassis so the receiver can drive a standard 8 ohm speaker.

Installed in the now-refinished cabinet the radio looks outwardly like any other Radiola 18. And like an ordinary Radiola 18, it still needs a decent long wire antenna. If any of you readers are crazy enough to want to build one of these, send me an SASE and I'll return a complete schematic and some construction notes for my Radiola 18-S! Good thing the sun finally came out so I could get to my other projects... ☺



Partial power supply schematic showing how the d.c. filament voltages were obtained.

RADIO REPRODUCERS

EDITED BY **DAVE CROCKER**, 35 SANTUIT POND RD., #4B, MASHPEE, MA 02649
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
Ceramic Horn Speakers

Horn speakers came in many sizes, shapes and colors. They were also offered in many kinds of materials, including: metal (Atwater Kent), fiber (Magnavox), cardboard (Murdock), glass (McKee), plaster (Voice from the Sky), wood (Timbertone), hard rubber (RCA), celluloid (Majestic), Bakelite (Dictogrand), pressed wood (Madera), papier maché (Confucius), and even sea shells (Oro-Tone). But did you know that there were a precious few made using ceramic?

One of these seldom-seen units is the trumpet-shaped unit pictured, which has no manufacturer's name. The entire speaker is formed of cast ceramic with a brown-purplish glaze. It weighs about 11 pounds and has a 9" bell diameter. It measures 11½" long (not including the driver). This piece came with a rubber reproducer holder made by Radio Industries Co. of New York. The rubber mount looks like it would fit a Baldwin reproducer. Whether Radio Industries made the ceramic horn also is not known.

Another cute little horn is a gray and yellow cube formed of one piece of pottery. Maybe "little" isn't the right word. This unit weighs in at 13½ pounds! It measures 5½" wide, 7¾" tall and 7½" deep. Cast in relief on both sides is a singing bird on a branch. The only other marking is a logo on the bottom having the letters M, I, K, R, O, in a spoked circle. Because there is no name on the reproducer, John Terrey, its owner, believes it was made in England.

Not much else is known about these colorful (and heavy) speakers except that they make delightful additions to any collection. One reason why they are so scarce might be what's likely to happen if such a speaker is dropped!

No, I didn't forget the ceramic "auditorium" horn by Bennett & Co. of Chicago...but the two units I included in this article much more rare. 

Photographs, above: Yellow "singing bird" speaker has no manufacturer's name, may be English.

Center: Reproducer in base of "singing bird" is unmarked. Note circular logo at right.

Below: Ceramic horn has brown-purplish glaze, manufacturer uncertain.





Radio Navigation Systems, VLF through MF

Part 1 — Basic Principles

The post-WWII era has seen the development of a number of important radio navigation systems. Most of these operated on frequencies below the standard AM broadcast band (Table 1). Notable exceptions were radar and the Loran-A system around 1900 kHz. Beyond a doubt the introduction of satellite positioning, with its superior accuracy and low user cost, has caused the demise of many of these systems. Beginning with a discussion of the simplest radio navigation systems, this article will go on to briefly review the basis of the “hyperbolic” radio navigation systems known as Loran and Omega.

Low-Frequency Radio Beacons

The simplest below-the-broadcast-band radio navigation system was the LF band radio beacon. This navigation system had its beginning prior to WWI. In the U.S., most maritime bea-

cons have been decommissioned in favor of more modern radio direction finding systems. The maritime beacons were primarily under the control of the U.S. Coast Guard.

Still surviving are LF band beacons used primarily by civil and private aviation. In the U.S. most of these beacons are under the control of the Federal Aviation Administration. The majority of them radiate an omni-directional, vertically polarized low power AM signal, with a 25 to 100 watt double sideband carrier that is slow CW tone modulated.

The CW signal is usually a three-letter call sign that is assigned to that particular beacon. For example, the call sign MKP is the 287 kHz beacon near the Allegheny County Airport in West Mifflin, PA.

Excellent listings of these beacons can be found on the Long Wave Club of America’s Web site¹ and in a directory published by Kevin

| SYSTEM | FREQ. IN kHz | PRINCIPLE | DAY/NIGHT RANGE (MI.) | ACTIVITY |
|--------------|-----------------|-------------------------------|--------------------------|---|
| Radio Beacon | 30-3000 | RDF | 20/<200 | Aircraft beacons still operating in the USA |
| LORAN-A | 1850-1950 | Pulse Time Difference | 800/~800 | Long discontinued worldwide |
| LORAN-C | 90-110 | Pulse Time & Phase Difference | 1200/2400 | Still active worldwide |
| DECCA | 70-130 | Phase Comparison | 240 | Last stations shut down in March, 2000 |
| CONSOL | 250-370 | Collapsed Hyperbolic | 1200 | Last stations shut down in 1991 |
| OMEGA | 10-14 | Phase Comparison | 6000+ | Shut down Sept 1997 |

Table 1. Comparison of long-range navigation systems.

Carey². The LWCA's monthly publication, *The LowDown*, also contains information on below-the-broadcast-band beacons and the hobby of hunting for them. Figure 1 illustrates one method of radio direction finding, RDF, using beacons. The shipboard operator determines the angular direction (bearing) to two or more beacons using a directional antenna. The angles are plotted on transparent paper superimposed on a map which shows the locations of the beacons. It goes without saying that there will be only one place in the world that will have those bearings to those particular beacons.

Angular accuracy is $\pm\frac{1}{2}$ to 2 degrees, and the useable range extends from a few dozen miles to about 100 miles during daylight and possibly a few hundred miles during night. Over-extending the range may lead to significant errors.

The Need For Accuracy

Accuracy is a relative term. How accurate one has to be is likely to be defined by the consequences of not being accurate enough. A ship in the middle of the Atlantic Ocean really does not have to know its true position on the surface of the earth within a few hundred feet. Accuracy within one or two miles is good enough assuming the ship gives is able to give known obstructions a wide enough clearance. But once the ship enters New York Harbor, a navigation error of even a few dozen feet could spell disaster!

Whether the navigation task is traversing a familiar room in total darkness or crossing the Atlantic and entering New York Harbor, a navigator's success is very dependent on having the latest information. Current information is required as much today as it was in the heyday of VLF/LF navigation. For example, information on navigation hazards information is routinely broadcast on the U.S. Coast Guard Mariner's Bulletins and on WWV/WWVH³.

Let's say that an abandoned ship is dragging its anchor someplace in open water directly on your course. You might be using a satellite navigation system accurate to \pm a few meters, but you might be in serious trouble if you don't know about the ship. You should also be using a reliable "independent" backup system suitable for close up navigation, such as a short-range

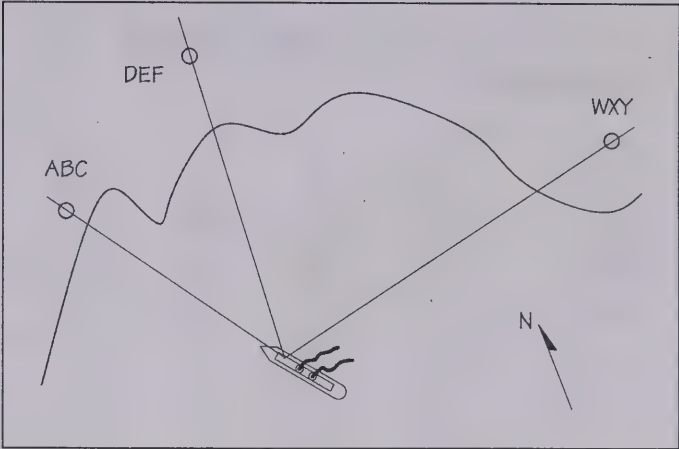


Figure 1: Example of radio direction finding using three LF beacons.

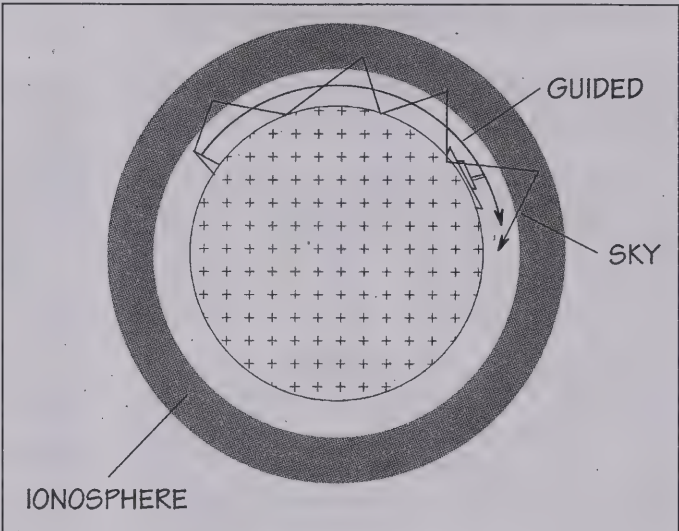


Figure 2: Comparison propagation pathways in "guided" and "sky wave" modes.

anti-collision (radar) system—not to mention human lookouts!

VLF through MF Systems

Accurate radio navigation requires the following:

- a. ground wave propagation
- b. frequency stability
- c. timing accuracy
- d. minimal co-channel interference over the intended operating radius

Until the development of satellite navigation, the VLF and LF bands were the most desirable choice for long distance radio navigation. The propagated radio energy at those frequencies is quite immune from solar, terrestrial and seasonal effects. The VLF wave propagates as if it were directed by a "wave-guide," with the earth acting as one conductive surface and ionosphere as the other one. This means that the radio wave's path

| TIME-SEQUENCED / EIGHT-SEGMENT FRAME | | | | | | | | |
|--------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| TIME SEGMENT | | | | | | | | |
| STATION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| NORWAY | 10.20 | 13.60 | 11.33 | 12.10* | 12.10* | 11.05 | 12.10* | 12.10* |
| LIBREIA | 12.00* | 10.20 | 13.60 | 11.33 | 12.00* | 12.00* | 11.05 | 12.00* |
| HAWAII | 11.80* | 11.80* | 10.20 | 13.60 | 11.33 | 11.80* | 11.80* | 11.05 |
| NORTH DAKOTA | 11.05 | 13.10* | 13.10* | 10.20 | 13.60 | 11.33 | 13.10* | 13.10* |
| LA REUNION | 12.30* | 11.05 | 12.30* | 12.30* | 10.20 | 13.60 | 11.33 | 12.30* |
| ARGENTINA | 12.90* | 12.90* | 11.05 | 12.90* | 12.90* | 10.20 | 13.60 | 11.33 |
| AUSTRALIA | 11.33 | 13.00* | 13.00* | 11.05 | 13.00 | 13.00* | 10.20 | 13.60 |
| JAPAN | 13.60 | 11.33 | 12.80* | 12.80* | 11.05 | 12.80* | 12.80* | 10.20 |

Table 2. Omega navigation system (see text).

length between two points on the earth's surface is highly predictable and repeatable on a 24/7 basis.⁴

As frequency is increased from the VLF to the LF band, the long-distance accuracy of a navigation system diminishes. This is due to the increasing unpredictability of the actual path length due to skip, or the sky wave effect. See Figure 2.

Timing accuracy for all of the navigation systems (except LF beacons) is of utmost importance. The transmitters are arranged in groups, where one acts as the master, and one or more others as slaves. We will discuss this later. The timing and transmit frequency(ies) are usually controlled by an atomic clock and are set up by the responsible authority using that authority's "master" atomic clock to calibrate the system's individual atomic clocks. For Loran-C and Omega this authority had been the U.S. Coast Guard worldwide.

To maximize accuracy, the only transmissions permitted on certain frequencies are the navigation transmissions. More than one navigation station can use the same frequency, but on a rigidly controlled "time shared" basis. Table 2 shows the time-shared system scheme used by the Omega navigation system. (The Omega system was totally shut down on September 30, 1997.)

The four common navigation frequencies are 10.20, 11.005, 11.33, and 13.60 kilohertz. The * frequencies are unique to that station for a particular time segment. The duration of time segments 1 and 6 are 0.90 seconds;

segments 2 and 8 are 1.00 seconds; segments 3 and 5 are 1.10 seconds; segments 4 and 7 are 1.200 seconds. Between each segment is a 0.20 second quiet period. Thus the total time sequence period is 10 seconds. (See references^{5,6} for additional details.)

Note: The 1/4 wavelength in air at 10.2 kHz is about 7,353 meters, or 24,124 feet, or ~4.57 statute miles! No doubt, the Omega transmitting towers were tiny stubs compared the 1/4 wave distance!

Hyperbolic Navigation Systems

Long-range radio navigation systems such as Loran, Omega, Consol, and DECCA operate using a "time difference" or "phase comparison" system. Simply put, a master station transmits a burst of coded RF, then one or more slaves (except in the case of Omega) transmit a coded burst at a very precisely controlled later time. The receiving station measures the time difference be-

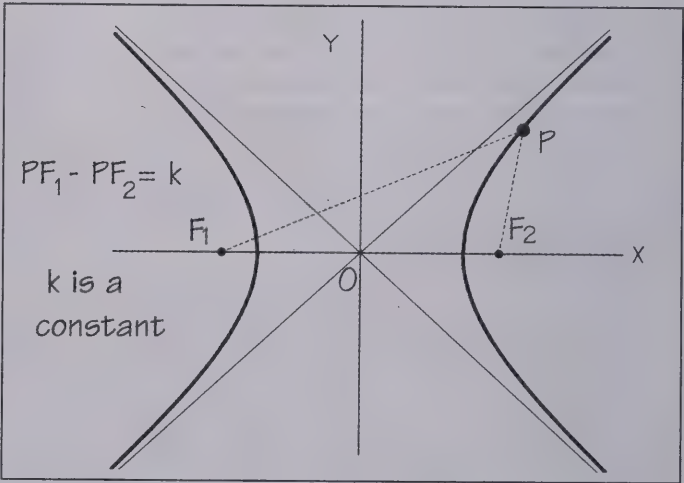


Figure 3: Graph of the equation of a hyperbola.

tween reception of the master and slave burst(s). In the case of Omega, the receiving station measures the phase difference between one station's "mark" signal and another station's "mark" signal. The key to understanding how these systems work is a basic appreciation of the basis for "hyperbolic lines of position." This notion may sound scary, but don't quit now! Let's try a very simple approach that should give you an idea of what a hyperbolic line of position is and how a "time difference"/ "phase comparison" navigation system works.

The curve of Figure 3 represents a hyperbola. The mathematical definition of a hyperbola is given as follows. Refer to figure 3 as you read it:

A hyperbola is a curve traced out by a point $P(x,y)$ if the difference between its distances from two other points is kept constant.

Notice that Figure 3 shows are two curves that are mirror images of each other. Look at the point $P(x,y)$ and the dotted lines, PF1 and PF2. These lines represent the distance between the point $P(x,y)$ and two fixed points F1 and F2. Now for the biggie, the length PF1 minus the length PF2 remains constant. That means as the length PF1 gets larger, the length PF2 must get larger by an equal amount.

Now for a simple numerical example. Suppose we choose the constant to have a value equal to 3. Now let's say the length of the line PF1 was 10, and PF2 was 7. Thus, $10-7=3$. Let's incrementally change the length of line PF1 to 11. In order to satisfy the definition, PF2 has to be equal to 8. Let the length of line PF1 be equal to 12 and PF2 must equal to 9. Ad Infinitum.

What about the mirror image curve on the other side of the vertical axis "y"? It represents the case where PF2 minus PF1 are kept equal to the same constant. The perceptive person may rightly ask "how do you get symmetry above and below the "x" (horizontal) axis?" Simple, drop a line vertically down from the point $P(x,y)$ until the line touches the curve below the "x" axis. We'll call this intersection $P'(x,y)$. If we were to draw the lines $P'F1$ and $P'F2$, we will find out the length $P'F1$ is identically equal to the length PF1, and the length $P'F2$ identically equal to PF2. In other words, for every "x" there is a plus and minus "y" value.

Suppose we drew new hyperbolas with other constants, say 4, 5 and 6, all on the same axes. This would give us a family of hyperbolas of the same general shape but at different distances from the "y" axis (Figure 4). The shape of the new curves is similar to that of Figure 3. Notice

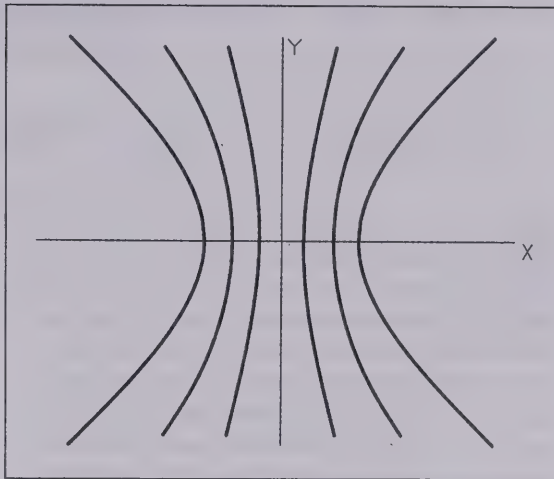



Figure 4: Family of hyperbolic curves.

that curves farther from the "y" axis are more pointed, diverging farther as the value of "y" is varied. Looking at it another way, as the constant representing the difference between PF1 minus PF2 decreases, the hyperbola moves closer to the "y" axis and gets less pointy.

One last point before we use this information to discuss practical navigation systems. let's not forget that the world is round. The real-world hyperbola used for radio navigation is not flat, but exists on the surface of a sphere. For now we will stick with the "flat earth" concept. Those of you wishing to take the earth's curvature into consideration are referred to a good text on calculus and analytic geometry.

Next time, we'll talk about some practical navigation systems using the principles just discussed. 

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WHO INVENTED THE GRID LEAK?

In his 1925 book *Radio: Beam and Broadcast*, A. H. Morse called the grid leak circuit “a frequent bone of contention in radio patent litigation” [1]. It takes little investigation to verify this statement about one of radio history’s simplest circuits (whose function is less than simple [2]).

We may never know who invented the grid leak resistor, but in a 1994 *Pittsburgh Oscillator* article [3] and in a 2001 book [4] I said that the circuit was invented by Lee de Forest, who applied for his patent on April 27, 1920. The patent (1,377,405) was granted May 10, 1921.

More recently, Karl Laurin said that it was Irving Langmuir who invented the circuit [5]. Langmuir’s patent (1,282,439), applied for in 1913, was issued in 1918.


RCA, General Electric, and Westinghouse Electric & Manufacturing Company, who either owned or had interests in the Langmuir patent, all came down on the side of Langmuir, not surprisingly. Their Bill of Complaint was brought against J. H. Bunnell & Co., A. H. Grebe & Co., and AT&T in 1923. AT&T owned the de Forest patent at the time [6,7].

The circuit is not mentioned in Langmuir’s biography [8], but de Forest does mention the grid leak in his autobiography, and manages to give himself some credit for the printed circuit at the same time. He wrote:

In this Metropolitan Tower transmitter room I devised the first “grid leak,” connected between the grid of the detector Audion and its filament—a graphite pencil mark on a strip of paper laid over a piece of hard rubber between two small binding posts... We soon began to sell this simple device, the first of today’s “painted circuit” components, to our “ham” customers. This proven early date of the grid leak enabled me later to invalidate the

basic patent thereon of Richards of the American Telephone and Telegraph Company [9].

Note that de Forest does not state what “this proven early date” is. Nor have I been able to find a Richards or AT&T patent for the circuit.

Whether de Forest invented the circuit or not, he got good mileage from his grid leak patent. W. Rupert Maclaurin reports that de Forest companies used his patent in eight lawsuits [10]. 

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SILENT KEYS

We record the passing of the following AWA members with deep regret.

CLARENCE E. FILLEY, W7KE, 92
(1-29-04) Hamilton, MT

JOHN H. HOLMAN, JR., W3INV, Malvern, PA

PAUL A. MATHIEU, San Angelo, TX 

Note: AWA officers and members are being asked to submit all information about Silent Keys to Joyce Peckham, Box E, Breesport, NY 14816. This will help in the collection and coordination of information and appropriate recognition of both AWA members and others who have made contributions to the electronics and entertainment industries.

BY LARRY BABCOCK

REPORT ON NIAGARADIO 2003

Photos by the author.

Although this meet took place almost a year ago, there's a good reason for reporting on it now. We've developed a tradition, at Larry's request, of covering last year's Niagaradio just before the next one is scheduled. We hope it will stimulate you to attend this very relaxed and interesting event. Look in "AWA News" for details about Niagaradio for 2004.—mfe

Another very successful Niagaradio meet took place last August 9th. As always, it was held at the Amherst Museum just North of Buffalo, NY. Though rain did threaten, it never came. This meet begins when the gate to the museum is opened at 8:00 a.m. Then buyers and sellers alike all dash in to set up or to purchase something for their collection. About 150 people attended, many of the regulars who come back year after year. And the attendees found plenty of good things for sale.

The museum is in a rural area and its quiet, park-like grounds are dotted with large trees and

historical buildings moved to this location as museum exhibits. Coffee and donuts are free, and the entrance fee is a modest \$5.00. This price includes all the space you want for selling and gains you entrance to the museum's indoor exhibits.

The museum opens an hour early for our meet so everyone can view the indoor exhibits including the large room of antique radios and television sets. There is a set of Rider's manuals for use by the public as well as a replica of an early 1920s radio service shop. The TV display includes a complete scanning disk receiver.

In another area is a grouping of early 1920s radios along with related magazines. There is also a Wurlitzer radio desk with folded horn speaker and room for batteries. When you enter the display room, a console radio starts playing an old time radio program. There is also a digital player that describes all the exhibits. The Niagara Frontier Wireless Association maintains this display with their own artifacts and changes it periodically.



Overall view of the flea market shows the spacious, park-like setting.

AUTHOR'S ADDRESS: 8095 CENTRE LANE, EAST AMHERST, NY 14051



View of my WWI aircraft radio exhibit. Jenny model is at extreme right.

A lot of Canadian collectors come to this meet and one of them, Lloyd Swackhammer, introduced his new book here. The large volume lists all of the radios known to have been manufactured in Canada. It is the first book to be published on this subject and many were sold.

As always, my wife runs our flea market table and sales were good. Tubes sold very well again this year, especially the older types such as 201As, 71As and 199s. Early ac/dc table models were popular as were 1920s battery sets. I even sold a novelty fire truck radio. Novelties have

not sold well recently but maybe they are becoming popular again.

The donation auction started at 10:30 and ran over an hour. Most of the items sold came from Marv Hess's garage. He just wanted to clean his garage out, but when he saw how much the items sold for, he wished he had put some of them on his flea market table! Even so, there were a lot of bargains here.

I sat next to Ed Gable at the auction. Ed is curator at the AWA Electronic Communication
(continued on page 46)



Did you ever see a radio auction in more pleasant surroundings?

BY RON LAWRENCE, KC4YOY
PRESIDENT AND CONFERENCE CHAIRMAN,
CAROLINAS CHAPTER, ANTIQUE WIRELESS ASSOCIATION

SPRING MEET IN THE CAROLINAS 2004

The 28th "Spring Meet in the Carolinas," Annual Conference of the Carolinas Chapter of the Antique Wireless Association, took place Thursday-Saturday March 25-26-27, 2004. This was its tenth year at the Sheraton Charlotte Airport Hotel, as always an outstanding site for a radio meet.

Again this year the gods smiled upon us and we had fantastic spring weather. There were 329 registered attendees not including spouses and other family members. 141 flea market spaces were sold. The Friday afternoon Old Equipment Auction had 110 lots with just over \$6,000.00 in total sales. Again this year this was a "pure" auction in that all the items submitted were by conference attendees, there were no large estate lots in the auction.

Things kicked off at 12 noon on Thursday with CC-AWA member Kirk Cline hosting a tube collectors forum. Then Jim Barnard shared his passion for collecting Zenith transistor radios. Jim had 50 Zenith transistor sets on display.

Next came long-time CC-AWA member Dr. Dennis Osborne with a very interesting talk about the RCA/Rider Chanalyst, which he called "the greatest advance ever made in the history of servicing instruments." And he had the data to back it up. Dennis was followed by an interesting panel discussion on "Preservation vs. Restoration" lead by Paul Farmer. Lots of interesting questions, answers and opinions were passed back and forth among the audience.

Wrapping up the afternoon program session was the CC-AWA annual membership meeting. One of the main topics was the rising cost of running a radio club and hosting a "national level" radio conference. The members in attendance agreed that it would be necessary to increase both dues and conference fees in the future. Following the close of the membership meeting, we boarded the hotel shuttle bus and several private cars to journey to the Open Kitchen for a fine dinner of Italian food.

The first day of the conference was wrapped up



View from Ron Laurence's hotel room shows plenty of action in the flea market.

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Tailgaters were blessed with fine weather throughout the conference.

with a great talk by Dr. Harold Cones about his new books on Zenith and the process of doing research for them. Dr. Cones really had everyone in the palm of his hand for almost two hours. Very interesting.

Friday was a bright and sunny Carolina spring day and there were several hundred radio collectors waiting patiently for our traditional 8 a.m. "LeMans Start." In case you haven't attended the Charlotte Conference before, the "LeMans Start" requires that EVERYONE must be out of the flea market area before anyone is allowed to enter. There is no buying, selling or displaying of merchandise before the 8 a.m. start time.

As always, things moved at a furious pace during the first few hours. A lot of radios were seen being carried past the registration tent on the way to the cars and trucks of their new owners.

The flea market was followed by the Old Equipment Auction in the afternoon and the annual banquet in the evening. After the banquet, many attended the contest room open house to view the entries and socialize.

The great springtime weather continued for the second flea market session on Saturday morning. That morning we offered a special Saturday-only \$5.00 admission. We also held our "Radio Res-

cue" session, in which the public is encouraged to bring their old radios out for our experts to identify and value. Individuals desiring to may offer their radios for sale in our "Radio Rescue Auction."

At about 7 a.m. on Saturday morning I was a phone guest on Don Russell's morning show on pioneer station WBT. We discussed the conference and the "Radio Rescue" service. I met about ten people who attended the conference and brought radios for "Radio Rescue" because of this publicity. Many thanks to WBT for their support.

Gary Carter WA4IAM hosted the first of what we plan to be an annual 9 a.m. event, the Vintage Amateur Radio Forum. About a dozen guys took part in a lively discussion. Final judging of the old equipment contest entries was also held on this busy Saturday morning, as well as the combined Radio Rescue and flea market vendor donation auction—which netted the club more than \$115.00.

The conference wrapped up early in the afternoon following the annual members luncheon. This may not have been the biggest Charlotte meet, but it was close to being so, and was without a doubt one of the best. We're already working on the 2005 Conference that will take place on Easter weekend, March, 24-25-26. See ya there! ☐

NIAGARADIO, *continued from page 44*

Museum and attends our meet every year. The support from AWA, especially in advertising the meet, helps greatly to attract visitors.

I decided to enter my collection of WWI aircraft military radios in the contest. It required a complete 8 ft. table. Major items included were a SCR-65 Radio transmitter, SCR-59 Receiving set, SCR-68 Airplane Transmitter and Receiver, BC-11-A Airplane Radio Telephone, Radio Pro-

peller/Generator, Interphones, Power Distribution Box, Antenna Reel, cables and a model Jenny airplane. One item I still need to make this collection complete is the "50A Head Telephone Set," (Earphones). They would be mounted in a leather helmet. Can anyone help me with this?

We hope that you will be able to attend Niagara radio 2004 on August 7th! See the "AWA News" column for details. ☐

FLYING RADIO-CONTROLLED MODELS IN THE 1930S

Introduction

There have been many recent reports in the media describing unmanned aerial vehicles (UAVs) or robot aircraft—mainly concerning the Predator, most recently flown by our armed forces in the Middle-East. On the hobby front, radio control enthusiasts, for years, have enjoyed flying remotely-controlled model planes in parks and open spaces. The models can be as simple as basic foam structures with propellers driven by tiny electric motors. More advanced flyers are driven by gas engines and can perform a full range of aerial maneuvers through the use of radio controlled servo-motors. Solid-state radios are available in inexpensive kit form.

Radio amateurs and model flying enthusiasts were teaming up to create radio-controlled flying models as early as the 1930s. An FCC ham license was required to operate the transmitter. This is the story of one such partnership. In 1936 I began to discuss radio controlled model planes with Thracy Petridies, a high-school classmate. The discussions grew out of our respective interests in radio and aeronautics. We eventually decided to build an RC model together.

That past summer I had received a ham license and built a 5-meter AM rig. The portable transmitter, which would operate on any frequency of choice between 56 to 60 MHz, was well-suited for radio control work. Thracy had built many flying models and had already initiated work on a serious flyer.

It was clear from this time on that our school homework would be suffering. Since we were deep in the Depression, there were serious economic constraints for both of us. But we decided to try to get airborne as soon as we could using

supplies and components that we had on hand.

One requirement was clear. The model would have to have sufficient wingspan to accommodate the anticipated payload (about 18 ounces) of the radio receiver, battery pack, mechanical actuators and other vital items for a sustained flight of about 15 minutes. Further, the plane would have to have very stable flying characteristics because it would be controlled only by the rudder. In moments of great enthusiasm we anticipated adding more controls later.

The limit of size and payload was dictated by two factors. (1) We already had a 1/5-hp Brown gas engine for the power plant. (2) The wingspan



Advanced twin-engine Super Dolphin (1939).

could not be any greater than would fit in the bedroom where the plane was being constructed!

Control System

A type 19 dual triode was used in a unity-coupled oscillator circuit suitable for battery operation. When operated as a transceiver, this set provided reliable ham contacts to a distance of 10 miles line of sight. The power output of two watts was considered adequate only for control over a shorter range because the receiving antenna orientation and size would be less than optimum. The five-meter band was broad enough, we thought, that a clear channel could almost always be found for the CW pulsed control signal.

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There was no doubt that the RC receiver was the most crucial element in the control system. The circuit was a superegenerative detector, which had the advantage of high sensitivity obtained with only a single tube operating in a self-blocking mode. The received signal operated a sensitive relay which provided the current, through its contacts, to carry out the control functions.

We used a Raytheon RK62 tube that was ideal for the purpose. It required only a flashlight cell for the filament voltage. With 45 volts on the plate, the tube provided enough current to actuate a Sigma 5 sensitive relay. The relay required about 1 mA through its 10,000-ohm coil for actuation. When a signal was received the plate current differential was 0.2 to 0.5 mA, which closed the contacts provided that the relay spring had been properly adjusted. The receiver seemed suitable to start with, but had limitations which were discovered in the preflight tests.

An electro-mechanical actuator weighing just a few ounces moved the rudder for a change in flight direction. We built a spring-loaded escapement operated by an electromagnet. The spring was recovered from a wind-up toy, and the electromagnet was a rewound doorbell coil. The rotary motion of the escapement disc was translated to horizontal movement by means of a reciprocating-action lever sliding on a fixed pin

on the escapement disc. Linkage to the rudder was accomplished with strings fed through miniature pulley wheels.

Construction and Testing

It took 14 months to complete the fuselage, wing, RC radio and actuator. By now we were seniors in high school, and I was nearly flunking French. Balsa wood strips were used to form a planked monocoque fuselage that was lightweight, strong and roomy. The Brown engine required a high-tension coil and breaker point ignition. Most of today's model engines of today use Glo-Plugs instead of a spark ignition. Adjustment of the engine for full output was by means of a moveable lever that controlled the spark timing. Once everything was installed in the fuselage, the wing, of about 9 foot span, was attached to the fuselage by means of stout rubber bands. Our first model,

named *Dolphin*, was painted silver-blue.

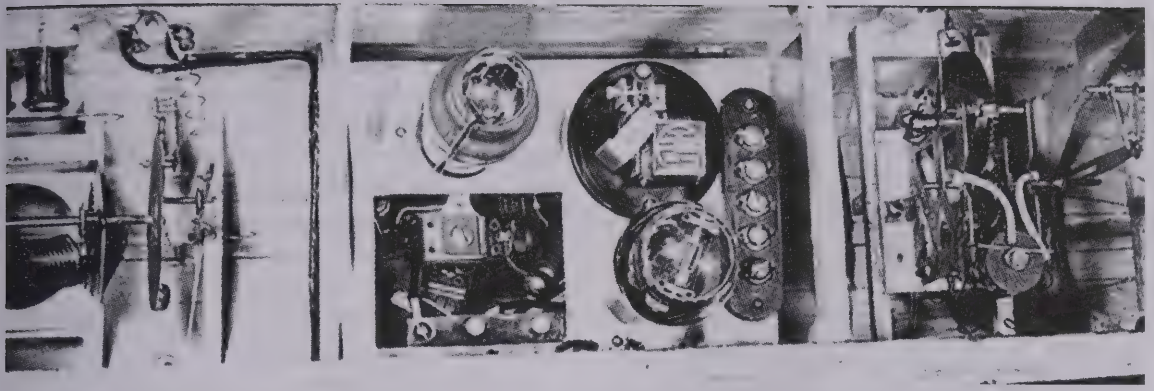
Initial testing of the control system was done with *Dolphin* at rest on the ground and the transmitter separated from it by the distance of a ball field. The tests revealed several problems that would require attention before we could attempt a flight.



Thracys Petrides (left) and author with original Dolphin (1937)



Radio Amateur Station W2JXJ in 1938. Five-meter control transmitter at top, right of relay rack. Five-meter transceiver to left of home-brew receiver in plywood cabinet.



View inside fuselage of Super Dolphin, showing experimental receiver and escapement actuator controls for rudder and engine (1938).

Considerable vibration was noted with the engine operating on full throttle. This caused movement of the relay armature. To overcome this, the receiver assembly was mechanically isolated from the fuselage by suspending it on rubber bands that acted as shocks.

It was observed that the receiver was detuned when the antenna (a wire threaded through the fuselage), was close to the ground. Thereafter all tuning was done with the fuselage suspended from a tree branch or other support. The transmitter was resonated to the preset receiver frequency.

Small pin jacks were mounted on the outside skin of the fuselage to serve as test points for pre-flight monitoring of all the battery voltages as well as the detector plate current flowing through the relay coil. That way we didn't have to remove the wing to make checks and determine if the tuning was optimum. Once these upgrades were finished, we felt secure enough to go flying.

Flying the Plane

The plane's nine-foot wingspread presented a considerable transportation challenge. Among the solutions we considered were to find a friend with a convertible, pickup truck, or auto having a broken rear window. On one occasion, when we were invited to demonstrate *Dolphin* at the National Model Show in Philadelphia, we made the trip from New York City in a DeSoto "sky-view" taxi driven by a sympathetic neighbor. Finding a suitable place to take off and land a heavy flying object was a serious issue since there was potential for causing considerable damage. We had to compromise on the nearby New Jersey meadowland, even though there were few available access roads and no cleared fields. With the engine screaming at full throttle, *Dolphin* was hand launched and slowly gained altitude. The rudder responded every time the

transmitter was keyed and rapidly sequenced to the desired position for each turn. Seen from a distance in flight, its wings forming a "V," the plane resembled the turkey vultures that frequently soar above the Hudson River Palisades.

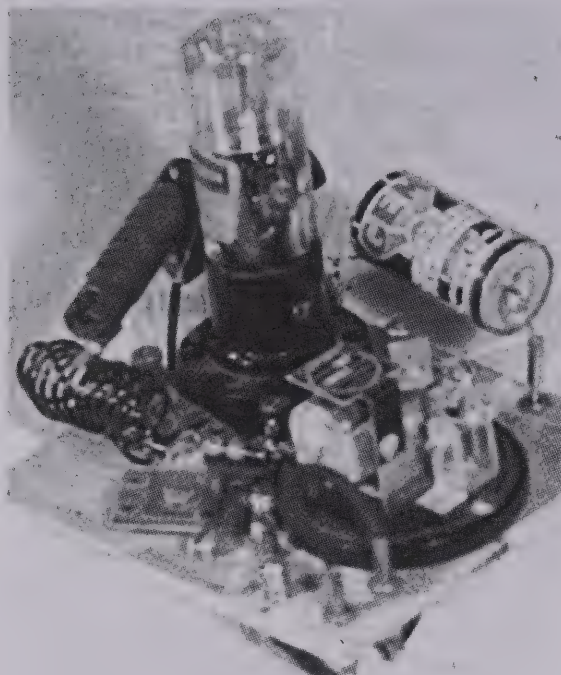
A moment of great satisfaction occurred when the plane was at a low altitude and directly overhead. We could then clearly hear the escapement release in response to the radio commands.

As planned, the engine quit, while remaining in radio range, after its fuel supply was exhausted. In glide mode the descent was slow, and controlled to land into the light breeze. However, the landing was not made in the desired area, *Dolphin* was snared by tall marsh weeds that fortunately cushioned the impact. Treading into the marsh and recovering the model was another matter! After further adventures of this kind, it became clear that proper radio control of flight would require the ability to control ascent and descent.

On one occasion those in a little group that was gathered to watch on of the launches were startled to hear a voice echoing from within the model: "this is W2—calling CQ on 5 meters..." This unanticipated sound was created by vibrations of the relay armature in response to the detected audio signal. The 5-meter band was very popular for phone contacts and we realized that there would be no assurance of a clear control channel for control. A more secure mode of transmission would be required.

Advanced Design

Upon receiving an invitation to display *Dolphin* at the 1939 New York World's Fair (possibly it was at the "Wonder Bakers" Pavilion), we decided to install upgrades to assure that our RC model reflected most of the realizable technology of the day. The result was a redesign of the entire concept, with emphasis on adding altitude control, more lifting power, and an updated radio system.



Superregenerative receiver with RK62 tube and Sigma 5 relay (1937).

The most straightforward method of controlling altitude was to control engine power. This was accomplished by building a second escapement mechanism to move the spark-timing lever to any of three possible positions, giving the option of three engine speeds.

The radio system now had to fulfill several new requirements. Since we were now controlling altitude as well as direction, either a time-shared or a multi-channel circuit would be needed. The receiver current output differential through the sensitive relay had to be at least one milliamperes when the control signal was received. Further, the receiver control function was to be relatively immune from spurious noise and interfering signals.

The most successful design used a sub-carrier modulation of the transmitter and two band-pass filters in the receiver. As built, the receiver required dual triodes with some increase in battery drain. Adding the advanced receiver, altitude control actuator, and additional battery supply, exceeded the payload that the 1/5 H.P. engine and the wing loading could tolerate. It was necessary to increase the wingspan and add a second engine. Instead of mounting the twin engines on the fragile wing, as in conventional aircraft, a forward structural support was added to the fuselage. Finally, the spark timing levers were linked so that the engine speeds were synchronized.

We wanted to demonstrate that the advanced model could be controlled over long distances from the takeoff and landing "field." Communi-

cation between observer and controller was by a separate 5 meter link. A more powerful 5 meter transmitter was required to span an anticipated distance of 10 miles or greater. A pair of type 45 tubes with a very stable 250 volt plate supply was used as a push-pull oscillator. Everything was done to maximize frequency stability, but a MOPA or crystal oscillator with multipliers would have been a better choice.

The remote control station, W2JXJ, was located in a five-story apartment building in the Washington Heights section of Manhattan. The oscillator fed a 3 element horizontal rooftop antenna through ordinary twisted-pair wire. With several watts into this high antenna, a strong signal was received, even at ground level, six miles away at the New Jersey meadowlands location.

Documenting the Project

Starting in 1939 we began writing a series of articles describing *Dolphin* and its control system, for the magazine *Model Airplane News*. Some time later Dave Ellman, MC of the radio show *Hobby Lobby*, invited us to talk about amateur radio and our experiences with radio control. During that program we attempted to describe the excitement and satisfaction of our combined hobbies of amateur radio and model airplane construction. This author remembers his closing remarks "Some day radio controlled aircraft will be the first line of American defense." Not too long afterwards, with the events of December 7, 1941, all amateur radio privileges were suspended, as was work on our RC project. ■

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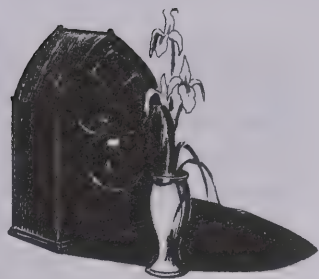
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RECENT RADIO, TV AND ENTERTAINER OBITUARIES

COMPILED BY **CHARLES S. GRIFFEN WIGYR**

1225 NEW BRITAIN AVE., WEST HARTFORD, CT 06110-2405



Note: When known, the date of death is indicated in parenthesis.

ALISTAIR COOKE, 95, (3-30-04) writer and commentator. Cooke began his career with the BBC and in 1935 became a correspondent for NBC in London. He is probably best remembered for his weekly broadcasts of *Letter from America* for BBC radio. The program, which chronicled life in America, aired for 58 years until March of this year when ill health forced him to retire. Prime Minister Tony Blair said: "He was really one of the greatest broadcasters of all time, and we shall feel his loss very, very keenly indeed." *Letter to America* began as *American Letter* in 1946 but was renamed in 1949. Cooke also appeared on television as host of *Omnibus* (CBS 1953-1956, ABC 1956-1957), *America* (NBC 1972-1973) and *Masterpiece Theatre* (BBC/PBS).

Cooke received Emmys in 1973 for his narration of *America* and for writing "A Fireball in the Night" for *America*. He received another Emmy in 1975 as host of *Masterpiece Theatre*. In 1985 the National Academy of Television Arts and Sciences presented him with the Eighth Annual Atlas Governor's Award. The Queen of England awarded him an honorary knighthood in 1973 and the next year he was asked to address the United States Congress on its 200th anniversary.

DON CORNELL, 84, (2-23-04) singer. Cornell was a vocalist with the Red Nichols Band and later the Sammy Kaye Orchestra before starting a successful solo career in 1950. A sampling of his hit recordings includes *It Isn't Fair*, *I'm Yours*, *The Bible Tells Me So*, *Most of All* and *Hold My Hand*. In all, Cornell's recordings sold over 50 million copies. He made television appearances on *Opera vs. Jazz* (ABC 1953) and *Dick Clark's World of Talent* (ABC 1959). Cornell also guest starred on many other shows such as those of Arthur Godfrey, Perry Como, Ed Sullivan, Jackie Gleason and Johnny Carson. He regularly entertained at nightclubs in Las Vegas, Atlantic City and Lake Tahoe, as well as on concert stages. His final performance was in Febru-

ary 2003. Cornell was honored in 1963 as one of the first stars on the Hollywood Walk of Fame and in 1993 he was inducted into the Big Band Hall of Fame.

PEGGY DeCASTRO, 82, (3-6-04) vocalist. Peggy DeCastro was the oldest member of the DeCastro Sisters, a Latin singing group that gained fame in 1954 with their hit recording of *Teach Me Tonight*. It sold over 5 million copies. Other favorites include *Boom Boom Boomerang*, *Too Late Now*, *Snowbound for Christmas* and *Cowboys Don't Cry*. She and her sisters, Cherie and Babette, performed regularly in nightclubs and at the Desert Inn and Sahara Hotel in Las Vegas. During some of their engagements they performed with George Burns and Noel Coward. In 1947 the sisters, introduced by Bob Hope, appeared on the first live broadcast from Los Angeles television station KTLA.

HARRY FLEETWOOD, 86, (1-18-04) classical music host. Fleetwood was the commentator for an all-night classical music program on WNBC(AM) in New York City from 1954 to 1975 and then on WNCN until the late 1980s. On other programs he read poetry, sang folk songs and traveled around the nation to profile interesting people. His fluent French also allowed him to host programs for French and Belgian television. The radio and television commentator Charles Osgood attributed Fleetwood's appeal to his being "so wonderfully civilized." "He just sounded like a very intelligent and gracious sort of man." Fleetwood began his radio career in Camden, NJ in 1938. After completing military service in WWII he joined a radio station in Philadelphia in 1948. In 1953 he was chosen from the more than 1,500 announcers who auditioned to host *Music Through the Night* on WNBC.

ART JAMES, 74, (3-28-04) game show host and announcer. During the 1960s James was the host and announcer for the network daytime television game shows *Say When!* and *Fractured Phrases*. In 1958 he was the announcer and understudy for Hugh Downs who was hosting the

new game show, *Concentration* (NBC). For the next 28 years James worked on *Play Cards!*, *Who, What or Where Game*, *Blank Check*, *Face the Music* and *The Magnificent Marble Machine*. His last show was *Family Feud Challenge* in 1992. During WWII he served two years as an announcer for the Armed Forces Radio Service in Europe. James was President of Art James Productions and taught at several southern California universities.

BOB KEESHAN, 76, (1-23-04) children's television host. Keeshan delighted millions of children and their parents as Captain Kangaroo on the television show of that same name. *Captain Kangaroo*, carried by CBS from 1955 to 1984 and then for six seasons on PBS, received five Emmy Awards and three Peabody Awards. Keeshan said he knew what made the show a success and it wasn't violence. "Violence is part of life, and there is no getting away from it," he once said. "but there is also gentleness in life, and this is what we have tried to stress on our shows." He made his television debut in 1948 as the clown "Clarabell" on *The Howdy Doody Show* (NBC) but was fired by host "Buffalo Bob" Smith after a disagreement in 1952. Soon Keeshan was hired to play "Corny the Clown," the host of *Time for Fun* on WABC(TV) in New York City. He remained with the program until he joined CBS in 1955. Keeshan's interest in radio began while he was in high school and in his senior year he worked during the evenings as a page at NBC Studios in New York City.

GENE KLAVERN, 79, (4-8-04) radio host. Klaven was half of the team "Klaven and Finch," which was heard mornings from 1952 to 1968 over WNEW(AM) in New York City. Dee Finch was the straight man while Klaven changed his voice to play wacky characters, such as "Trevor Traffic" and "Sy Kology." He provided a "zani-ness and a comic irreverence" which sometimes was aimed at the show's sponsors. Klaven also appeared as a panelist on the television shows *Make the Connection* (NBC 1955) and *Who Pays* (NBC 1959). By 1971 a third of the station's 24 hour revenue was produced by their four-hour program.

Finch retired from the show in 1968 and Klaven continued the show alone as *Klaven in the Morning*. The show moved to WOR(AM) in 1977 and Klaven left radio in 1980. Klaven later worked as the host for the American Movie Classics cable television channel and was a comic

commentator for WCBS(TV) in New York City. He began his broadcasting career in Baltimore and Washington before coming to New York City.

MERCEDES McCAMBRIDGE, 87, (3-2-04) actress. McCambridge "specialized in playing forceful, domineering characters" in her film roles. She won an Academy Award as best supporting actress for her performance in *All the Kings Men* (1949). Some of her other film credits include *Johnny Guitar* (1954), *Giant* (1956), *A Farewell to Arms* (1957), *Touch of Evil* (1958), *Cimarron* (1960), *99 Women* (1969), *The Exorcist* (1973) and *The Concorde - Airport '79* (1979). She also performed on stage and enjoyed success in *Lost in Yonkers* (1991) on Broadway and on tour. McCambridge was in demand as a cast member on radio dramas, mysteries and soap operas because of her vocal versatility. Orson Wells once called her "the world's greatest living radio actress." Some highlights of her radio work include *The Adventures of Bill Lance* (CBS West Coast 1944-1945), *Big Sister* (CBS mid 1940s), *The Guiding Light* (NBC 1937-mid 1940s), *I Love a Mystery* (NBC 1949-1952), *Lights Out* (NBC 1935-1939), *Midstream* (NBC Red and/or Blue Networks 1939-1941), *Studio One* (CBS 1947-1948), *This is Nora Drake* (NBC 1947-1959, CBS & NBC 1948-1949, then CBS only) and *The Whistler* (CBS 1942-1955). McCambridge appeared on television as a cast member of *One Man's Family* (NBC 1949-1950) and *The Wire* (ABC 1956-1959) and guest starred on *Chevrolet Tele-Theatre* (NBC 1948-1950) and *Hollywood Screen Test*.

JOE MCFARLIN, 78, (2-14-02) radio personality. McFarlin was the host of a late-night big band, swing and traditional jazz show on WCCO(AM) in Minneapolis/St. Paul during the 1960s, 1970s and 1980s. His musical taste and extensive knowledge of musicians made him popular with fans throughout the nation. McFarlin retired in 1992. Management and format changes had reduced his program to about two hours on weekends and his freedom to select recordings had been reduced to a jazz-free play list. He began his radio career in 1947 at WREX in Duluth and worked at several other stations before moving to Minneapolis/St. Paul in 1961. McFarlin was employed by KRSI before joining WCCO.

BILLY MAY, 87, (1-22-04) musician. May was a bandleader, composer and arranger whose

distinctive style was popular with vocalists such as Frank Sinatra and Peggy Lee. He was associated with Sinatra from 1939 to 1969 and worked as the arranger-conductor on his *Come Fly With Me* album in 1958. It became a No. 1 on the *Billboard* chart and established May as a leading West Coast arranger. During the 1950s May had his own band and enjoyed success with his arrangements of *All of Me*, *LuLu's Back in Town*, *Charmaine*, and *When My Sugar Walks Down the Street*. During this time he also composed *Lean Baby* and *Fat Man Boogie*. His band made television appearances on *Let's Dance* (ABC 1954) and *The Milton Berle Show* (NBC 1958-1959). His television work also included composing, with Milton Raskin, the theme for *Naked City* (ABC 1958-1963), and music for a number of other programs including those of Red Skelton and Ozzie and Harriet Nelson. He also provided the musical scores for *Sergeants Three* (1962), *Johnny Cool* (1963), *Tony Rome* (1967) *The Front Page* (1974) and other movies.

May began his career as a trumpeter with the Charlie Barnet Band in 1938, which scored a great hit with his arrangement of *Cherokee*. The next year he joined the Glenn Miller Band where he played trumpet and provided the arrangements for *Take the "A" Train* and *Serenade in Blue*. During the 1940s May also wrote arrangements for the Les Brown, Woody Herman and Alvino Rey Orchestras and worked in studios and for NBC.

ANN MILLER, 81, (1-22-04) actress and dancer. Miller appeared in over forty films, many made during the late 1940s and early 1950s. The actress was in a number of MGM musicals including *Easter Parade* (1948) with Judy Garland and Fred Astaire, *On the Town* (1940) with Gene Kelly and Frank Sinatra and *Kiss Me Kate* (1953) with Bob Fosse. Miller, who claimed the record of 500 taps a minute, had supporting roles at RKO, Columbia and Republic Studios before signing with MGM in 1948.

Miller's film career began at RKO where she appeared in *New Faces of 1937* and *Stage Door* starring Ginger Rogers and Katharine Hepburn. In 1938 she had a role in Frank Capra's *You Can't Take It With You*, which won a best-picture Oscar. She achieved fame in her sixties on stage in *Sugar Babies* and received a 1980 Tony Award nomination. She co-starred in the production with Mickey Rooney on Broadway and with the touring company from 1979 to 1982. In later

years Miller remained active making guest appearances or being interviewed on television shows and made her last film appearance in *Mulholland Drive* in 2001.

CHUCK NILES, 76, (3-15-04) jazz radio host. Niles was a leading figure in the jazz radio scene in Southern California for more than 40 years. At time of death he was heard on KKJZ(FM) in Long Beach where he had hosted his jazz program since 1990. Prior to this he was associated with KNOB, a pioneering jazz station in Los Angeles, from 1957 to 1965 when he joined KBCA (later KKGO) another all-jazz station. When its format was changed to classical music he moved to KLON(FM) in Long Beach. (The station's call letters were changed to KKJZ in 2002). Niles began his radio career on the East Coast but in 1956 he relocated to California and found employment on KFOX playing rock'n'roll, which wasn't to his liking. He left KFOX to work at KHJ(TV) hosting an afternoon movie program called *Strange Lands and Seven Seas*. Niles, a trained musician, possessed an encyclopedic knowledge of jazz and counted many of the jazz "greats" as his friends.

JACK PARR, 85, (1-27-04) comedian. Paar, who "was incisive, witty and highly emotional," pioneered the late-night television talk show format when he replaced Steve Allen as the host of *The Tonight Show* (NBC 1957-1962). Some of his other TV credits include *Up to Paar* (NBC 1952), *The Jack Paar Show* (CBS 1954) and *The Jack Paar Program* (NBC 1962-1965). Paar left television in 1965.

Earlier Paar was heard on such radio shows as *The Jack Paar Show* (NBC 1947), which replaced *The Jack Benny Program* during the summer of 1947, hosted *The Breakfast Club* (ABC) while Don McNeill was away in 1948 and was the quizmaster on *Take It or Leave It* (NBC 1950-1951). Paar also appeared in films including *Walk Softly, Stranger* (1950), *Love Nest* (1951) and *Down Among the Sheltering Palms* (1953). He began his career as a disc jockey and comic on small radio stations in Indiana, Ohio, New York and Pennsylvania.

ALVINO REY, W6UK, 95, (2-24-04) band-leader. Rey, a guitar virtuoso, founded *The Alvino Rey Orchestra* in 1939. The band's first big recording success was *Deep in the Heart of Texas* (1942) followed by such top-10 hits as *Strip Polka* (1942), *Cement Mixer [Putti-Putti]* (1946) and *I'm Looking Over a Four Leaf Clover*

(1948). In the early years, the group was heard on KHJ(AM) in Los Angeles and *Gene Autry's Melody Ranch* (CBS). On television the orchestra performed on *The King Family Show* (ABC 1965-1969). Rey began his career with the Phil Spitalny Orchestra in 1928 and six years later he joined *Horace Heidt and His Musical Knights* as their steel guitarist. In 1937 he married one of the King Sisters (Luise), who were the band's vocal sextet. When Rey left Heidt's band in 1940, the sisters went with him. He is credited with developing the pedal steel guitar and at one time helped the Gibson Guitar Co. with an improved guitar pickup. In 1978 he became the first inductee into the *Steel Guitar Hall of Fame*, where he was reorganized as "the father of the pedal steel guitar." An amateur radio operator, he was first licensed in 1922.

JOAN RICHMAN, 64, (4-2-04) network news producer. Richman was Vice President and Director for Special Events at CBS News from 1981 until her retirement in 1989. She began her career clipping newspapers in the research library of CBS News and by 1965 became a researcher in a special events unit. Richman became a full producer in 1968. She won three Emmys for producing Walter Cronkite's space coverage for the Apollo 13 and 14 missions in 1971 and the Apollo 15 mission in 1972. From 1973 to 1975 Richman worked for ABC as Senior Producer for *The Reasoner Report*. She returned to CBS in 1976 as Executive Producer of the weekend editions of *The CBS Evening News* and also produced special events coverage that included the election-night specials in 1976, 1978 and 1980. Richman achieved her success in broadcast journalism when it was rare for a woman to become a senior media executive.

KEN SASSO, 58, (3-23-04) talk-show host. Sasso began doing an evening talk show on KOA(AM) in Denver in 2001. Prior to this he was Vice President of Operations at Salem Communications Corporation in Colorado Springs. The multi-media firm operates over 90 radio stations nation-wide, with 58 stations in the top 25 most populated sections of the country. Jerry Bell, Program Director at KOA, said Sasso left radio management because "... he had a passion to do radio." He began his radio career in 1962.

BRIGADIER GENERAL LELAND W. SMITH, W5KL, (ex-W4AGI, W4YE, W4BEA, W4PCS, W3JJO and K6CN), 90, (2-15-04) USMC (Ret.). Smith joined the U.S. Marine

Corps in 1937 as a private, earned a commission as a second lieutenant in 1940 and attained the rank of Brigadier General in 1966. He was commander of a radar unit in the Pacific Theater in WWII and during the Korean Conflict was an electronics officer on the staff of the Commanding General. Smith was President of the Quarter Century Wireless Association, Inc. from 1986-1989 and was later named President Emeritus. He was the sitting President of the Old Old Timer's Club (OOTC) and held a number of American Radio Relay League (ARRL) section-level positions that included service as Section Communication Manager (SCM, now SM) prior to WWII and later served as an Assistant Director and advisor of ARRL's Delta Division. He was also a former Director of the Radio Club of America.

SIR PETER USTINOV, 82, (3-28-04) actor. British-born Ustinov's talents included acting, writing plays, movies and novels as well as directing operas. He received Oscars for his performances as Nero in *Quo Vadis?* (1951) and the detective Hercule Poirot in *Death on the Nile* (1978). Some of his other film credits include *The Sundowners* (1960), *Spartacus* (1960), *Topkapi* (1965), *The Last Remake of Beau Geste* (1977) and *Charlie Chan and the Curse of the Dragon Queen* (1981.) Ustinov guest starred on a number of television shows and received three Emmys for his performances in "The Life of Samuel Johnson" (*Omnibus*, NBC 1957), "Barefoot in Africa" (*Hallmark Hall of Fame*, NBC 1967) and "A Storm in Summer" (*Hallmark Hall of Fame*, NBC 1970). In 2003 he played himself in the television movie *Winter Solstice*. For thirty years Ustinov devoted himself to the world's children as the goodwill ambassador for UNICEF. He was knighted by the Queen of England in 1990.

Information for this column was obtained from *The Big Bands* (4th ed.), *The Complete Directory to Prime Time Network and Cable TV Shows 1946-present* (12th ed.), *Hartford Courant*, *On the Air: The Encyclopedia of Old-Time Radio*, *QCWA Journal*, *QST*, www.newsvote.bbc.co.uk, www.broadcastingcable.com, www.doncornell.com, www.ejazznews.com, www.jazzhouse.org, www.latimes.com, www.newsvote.bbc.uk, www.nytimes.com, www.salem.com, www.startribune.com, www.us.imdb.com, www.washingtonpost.com and www.wic.org.

Thanks to Dr. A. David Wunsch for additional source material. 

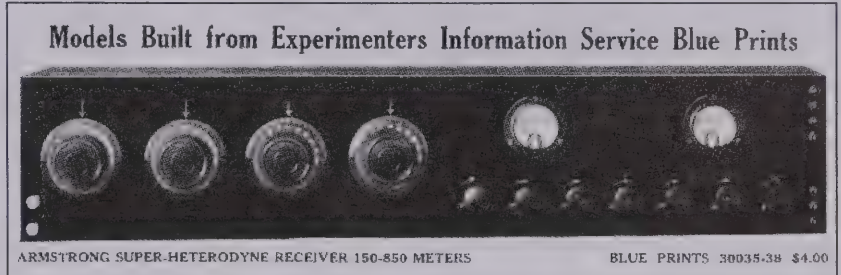
HOW A JUDGE “UNLOCKED” THE SUPERHETERODYNE CIRCUIT

In the year 1918, prolific radio inventor Edwin Howard Armstrong was stationed in Paris with the Army Signal Corps. During this time, expanding on one of his earlier theories, he developed a way to substantially amplify an incoming high frequency signal by first changing it to a lower frequency. He called the principle “Super Heterodyning.”

By 1922 he and Harry Houck, who had served under Armstrong in Paris, had made many improvements to the circuit, including reducing the tube count. The equipment was shown to RCA’s David Sarnoff in February 1923. Sarnoff immediately stopped all development of sets being readied for the following Christmas season, and had his engineers begin working on radio models incorporating the new circuit.

Sarnoff also gathered together all other RCA patents that pertained in any way to the superheterodyne. He wanted to be ready to bring suit against the patent infringers who were sure to emerge once the new Radiola superheterodyne models were introduced. But the engineering de-

partment was not up to the job, and Armstrong and Houck had to be called in to complete the development of the new line. The RCA superheterodynes weren’t brought to market until March 1924, when the lawsuits began immediately.



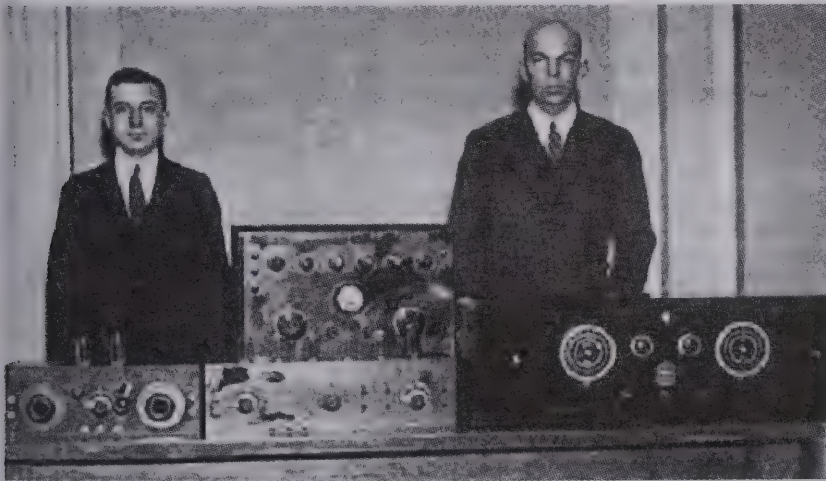
Experimenter’s Information Service ad for “Armstrong Super-Heterodyne” plans. From Wireless Age, July, 1922.

Suits were initiated against numerous superhet manufacturers, most notably Charles Leutz and his Experimental Information Service. Some believe that Leutz was the scapegoat for these litigations because of his very frank advertising of the Armstrong-invented circuit.

The judge’s opinion was that all manufactured, partly manufactured, and kit versions of the circuit, if not licensed by RCA, infringed on RCA’s patents. This could have been a devastating setback for the widespread adoption of the

circuit. But the last moment, the Judge would not allow a clear monopoly for RCA, a company already being publicly accused of anti-trust.

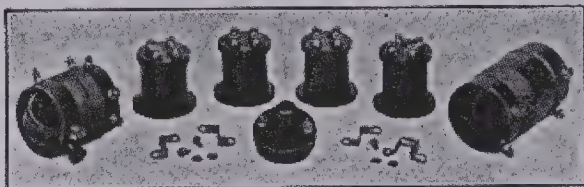
In a 1925 decision, he added a loophole. Kit versions of superheterodyne radios could be sold license-free to “experimenters and amateurs,” although it was not legal to market pre-manufactured, “knocked down” radios. Without that seemingly tiny loop-



Harry Houck (left) and Edwin Armstrong. From Radio News, May, 1924

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Mounted Binding Post Board, 1 Base Board, 1 Drilled Panel, 2 "Dialog" Vernier Dials, 2 Truitt Rheostat Dials, 3 Carter Jacks, 1 Carter Filament Switch, Soldering Lugs, Bass Wire and wood screws, diagram and instructions.

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William A. Welty Company, 36 So. State St., Dept. 605, Chicago

Welty superheterodyne kit offer. From Radio World Illustrated, October 10, 1925.

hole, the Radio Corporation of America, with its dominant patent position, would have been able to inhibit the proliferation of the powerful new circuit. But since the general public knew little about the new fad called "radio," it didn't take long for the young radio industry to realize that the judge's "experimenters and amateurs" must be none other than "John Q. Public!"

Companies not allowed to build and sell manufactured superheterodyne radios began advertising their kits to the public. New kit manufacturers sprang up all over the country. Radio parts houses bundled kits with everything necessary to build a complete radio, including the cabinet. These kits were sold for years by the thousands without litigation by RCA. Schematics were published in newspapers and magazines of the day. Construction articles appeared everywhere. Those daring enough to build the new circuit bragged about the sensitivity and power of their radios.

A few manufacturers built and sold completed super-

heterodynes despite the court order. When companies like Cleveland's Mazda Radio advertised such radios, the word "superheterodyne" was never mentioned. Technically, the intermediate frequency amplifier in a superheterodyne is a fixed tuned-radio-frequency amplifier. So the radios were sometimes described loosely as a "TRFs." Needless to say, these companies ran serious risks, but there appears to be no indication any were prosecuted.

Not long after the legal judgment was made public, individual

radio shops across the country began to assemble kits using additional parts off their own shelves. Many engraved a private brand name on the front panel. This is why a collector might find a "Berry" using a Receptrad kit or a "Long S-8" with Remler intermediate frequency transformers. Countless thousands of these locally built, cross-named, radios reached the public.

By 1926, custom set builders across the country were being solicited by national companies to construct the superheterodynes for resale even though sales were technically limited to

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
Solicitation for superheterodyne set builders. From Radio Listener's Guide, September, 1926.

experimenters and amateurs. Maybe RCA didn't believe that market was much of a threat but, within a couple of years, it had become a major business. However, by that time, RCA was getting ready to defend against anti-trust charges brought by the federal government. It couldn't very well turn around and sue the custom builders, thereby hurting its own case.

As time went on, with rapid changes in radio technology, retail outlets regularly had to offer massive sell-offs of "last year's models" at deep discounts to the public. Hundreds of companies went out of business due to over-production and changes in the public's interests. Not a problem for the companies making superhet kits. Last year's kit could be updated, at minimal cost, with a new schematic and a few new parts. There were no leftover models or out-of-date designs

to sell off.

Dramatic changes in retailing the superheterodyne occurred by late 1928. Taking advantage of RCA's anti-trust plight, national companies began advertising their sets as completely built, with the exception of only a couple of connections. It was stressed that finishing these radios required only a few minutes' time and no soldering. And, by mid-1929, completely wired, ready-to-play superhets were available. RCA's hands were tied by the lengthy anti-trust trial.

Over 700 brands, models, and variations of the superheterodyne have been documented from 1923 to 1930! What started as a "slam-dunk" patent suit by RCA created an explosion in the development and sales of the superheterodyne circuit that made it the most popular in the world to this day. 

INTRODUCING *AWA REVIEW*, VOLUME 17

Work on Volume 17 of the *AWA Review* is progressing, and barring last minute production problems, it will be available for purchase at the AWA Annual Conference in August. Volume 17 is expected to contain the following five articles:

"The Regency TR-1: 50 Years Later," by Paul Farmer (2004 is the 50th anniversary of the introduction of the first consumer transistor radio, the Regency TR-1, in 1954. Hence this comprehensive article about the TR-1 is extremely timely.)

"A History of the Kodel Radio Corporation" by John Leming, Jr. (Kodel is an important 1920s radio company, yet very little of its history has been documented. This fascinating article about Kodel and its founder, Clarence Ogden, addresses that need. Author John Leming has interviewed members of the Ogden family to uncover new information.)


"Broadcast Receiver Manufacture by General Electric and Westinghouse in the First Decade of RCA" by Robert Murray (Robert Murray has done extensive research on what occurred behind the scenes when GE and Westinghouse were producing RCA radios during the 1920s. RCA collectors and those interested in radio developments at GE and Westinghouse will find this article especially helpful.)

"Evolution of the Submarine Telegraph With an Extensive Bibliography" by Bill

Holly (Bill Holly provides a detailed chronology documenting key developments in submarine cable technology, and has prepared what is probably the most extensive listing of books and articles about submarine cables ever published.)

"The Evolution of the National HRO by Barry Williams" (HRO receivers have a well-deserved reputation for their innovative designs, and are particularly popular with collectors of communications receivers. Williams has researched and documented thoroughly the subtle differences among the many HRO models. If you collect HROs, this article is a "must have!")

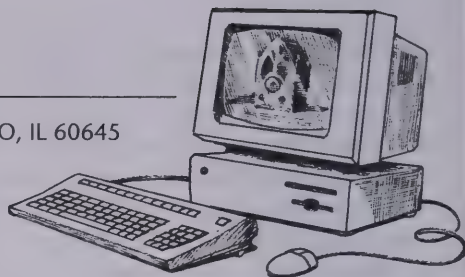
Look for *AWA Review* Volume 17, or an announcement about ordering information, at the August meet! The October issue of *The OTB* will also carry ordering information.

The authors of the articles noted above (or at least those who are able to attend) will be at the social hour prior to the Annual Conference Banquet to autograph copies of the *Review*. *Review* Editor Brian Belanger and *OTB* Editor Marc Ellis will also be available during the social hour to meet with prospective authors of articles for the *Review* and *The OTB*. If you are thinking of writing an article for either publication, take this opportunity to meet with Brian or Marc to learn about what is involved and to have your questions answered. 

ON THE INTERNET

EDITED BY **CHUCK SCHWARK**, 7454 N. CAMPBELL AVE., CHICAGO, IL 60645

PLEASE INCLUDE SASE FOR REPLY. E-MAIL: caschwark@aol.com



Old-Time Radio On the Web



Up to now, most of my topics have dealt with the “hardware” of radio communications. This time, I’d like to give you a taste of the “software” that was created and designed to be used by that hardware. I’m talking about old time radio programs; the mysteries, singers, comedy shows, serials, soap operas, plays and yes, the radio commercials.

There are many, many websites devoted to preserving our radio programming heritage. Some deal with the historical backgrounds of the shows and personalities; others offer collections of the shows themselves for sale or downloading. Most sites have lots of links to other old time radio websites.

“...And now, back to our program...”

Old-Time Radio

The Original Old Time Radio Pages

by Louis V. Genco

<http://www.old-time.com>

If you are interested in radio programs from “radio’s golden age” these are the pages for you. This website is loaded with resources: program guides, features, reference material and educational topics.

Radiolovers.Com

<http://www.radiolovers.com>

Radiolovers offers hundreds of vintage radio shows to listen to on-line in MP3 format, all for free. List includes comedies, dramas, mysteries, westerns, sci-fi, big band music and more.

Old Time Radio - Radio Days:

A Soundbite History

<http://www.otr.com/index.shtml>

Sound clips, radio news features, radio series programs like *Captain Midnight* and *Terry and the Pirates*, articles, and a web listening schedule.

The Nostalgia Digest by Chuck Schaden

<http://www.nostalgiaadigest.com>

[nostalgiaadigest.com](http://www.nostalgiaadigest.com)

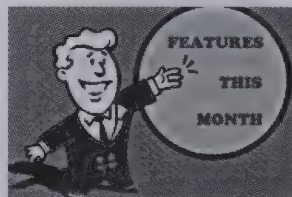
Nostalgia Digest is an electronic magazine that brings you lots of articles about the golden age of radio...the glory days of motion pictures... the big band era...recollections of growing up in gentler times...and photos of your favorite performers.



Heritage Radio Classics

<http://www.heritagerradio.com>

Offers collectors and nostalgia buffs the best in vintage radio shows from the 1930s, 40s and 50s on high quality audio cassettes and now, also, on compact disc.



Radio Spirits

<http://www.radiospirits.com>

This website offers all your favorite shows on CD, DVD/Video and cassette. On-line ordering and much more.

The CBS Radio Mystery Theater

<http://www.mousetrap.net/~mouse/cbsrmt/>

Provides historical timeline and personality information about this popular radio series that ran from 1947 to 1982. There are links to other sources of info on this program. 📺



About Our Authors

RICHARD T. AMMON

A Judge's Decision "Unlocks" the Superheterodyne Circuit

Richard served as a U.S. Army Signal Corps Instructor of basic and advanced electronics. He has had a career of almost 25 years in broadcasting, holding positions from DJ to Sales Manager, and has supervised ground-up construction of a 50 kW FM station, complete with new studios. He taught Radio/TV Broadcasting at Wabash Valley College in Mt. Carmel, IL. Most recently, Richard spent 18 years in the computer industry in varied positions that included sales and web site design.

He has been collecting old radios since he was 12 years old, and still has the first two radios he bought (how about an AK 944 and a Philco 70 for six dollars?). Serious collecting, emphasizing 1927 and earlier sets, began 35 years ago after his army service. Richard also has been databasing superhets for 35 years, and has documented seven hundred brands, models, and variations from 1918 to 1930. He was Editor of the Colorado Radio Collectors' Club newsletter and Publisher of the bi-monthly *Transistor Radio Collector* magazine. He would now love to get back into broadcasting and talk radio.



LARRY BABCOCK

Niagaradio 2003

Larry Babcock grew up in his dad's radio sales and service business, acting as a service tech while still in high school. After serving in the Infantry during World War II, he earned a BSEE degree at the University of Iowa and began a 37-year career at Bell Aircraft. At Bell, Larry headed programs to develop radar and air-to-air microwave relay links for the RACAL missile system and, later, to evaluate the army's military electromagnetic interference problems. During his last years at Bell, Larry was in charge of the design of electromagnetic compatibility (EMC), TEMPEST, ordnance safety, radiation hazards and lightning immunity for all military equipment produced by the company. Later he worked in these same fields as a consultant for other companies.

Larry began collecting antique radios in about 1973. He specializes in Federal, Wurlitzer, and WWI aircraft sets, and has written a book on the history of Federal Radio. He is on the board of directors of AWA, Inc. and serves as a guide at the AWA Museum in Bloomfield, NY.

CARL G. DAVIS, W9CR

What Did A Railroad Telegrapher Do, Anyway? (in "Key and Telegraph")

After attending the U.S. Maritime Radio School in Boston for one year (1941-1942), Carl served as a radio operator in the Merchant Marine for the remainder of World War II (1942-1945). He worked as a railroad telegrapher for several years after the war, and eventually graduated from University of Illinois (1959). After working in the aerospace industry for some years (he was involved in the Titan guidance system and also got to see the nuclear tests of October, 1962), he attended grad school at Northern Illinois University, receiving a master's degree in Geology. Carl then taught at Danville Area Community College (1969-1997) and is now retired. He has restored a number of radios and is currently working on a Crosley 52 and a Scott 16/18.



LEON HILLMAN, W2JXJ

Flying Radio-Controlled Models in the 1930s

Leon is a Registered (NJ) Professional Engineer with a career spanning over a half-century. He has been licensed as W2JXJ since 1936. He holds a degree in Electrical Engineering from NYU (evening division) and pursued advanced studies following service in the U.S. Army Air Force during WWII. He has been a section head at the U.S. Army Signal Engineering Lab at Ft. Monmouth, NJ, a Research Associate in the EE Department at NYU, and Chief Engineer of Production Research Corp.

In 1957 Leon organized his own company, Automation Dynamics. The firm developed antenna designs for aircraft and built instrumentation systems for atmospheric research. Later the company conducted test equipment projects for the U.S. space programs that sent the first men into space and to the moon. His biography appears in "Who's Who in America" and "Who's Who in Science and Engineering."



DAVID W. KRAEUTER

Who Invented the Grid Leak?

David Krauter was born in Homestead, PA in 1941. He holds an M.L.S. degree from the University of Pittsburgh. He has edited *The Pittsburgh Oscillator* and the monograph series of the Pittsburgh Antique Radio Society. Currently, David writes the "New Books and Literature" column.

(continued on page 61)



CLASSIFIED ADS

Old-time ads are free to members collecting and restoring equipment for personal use. Please observe the following: (1) one ad per issue per member; (2) include as SASE if acknowledgement is desired; (3) material must be more than 25 years old and related to electronic communications; (4) give your full name, address and zip code; (5) repeats require another notice (we are not organized to repeat automatically); (6) the AWA is not responsible for any transaction; (7) we retain the right to reduce an

ad's size if over seven lines; (8) AWA does not accept commercial advertising in this column; and (9) closing date is six weeks prior to first day of month of issue. Ads received after that time will be held for the following issue. Mail all ads to: **RICHARD RANSLEY, P.O. BOX 41, SODUS, NY 14551.**

IMPORTANT!

OTB classified ads are now available for browsing in the "OTB On Line Edition" on our internet web site (www.antiquewireless.org). This practice will give members dramatically increased exposure for their ads.

SELL/TRADE—GENERAL

Toy telephones, 7 inch candlestick phone, made of tin and wood, 1920s, \$30.; cradle phone with dial, made by Ideal, 1940s, hard black plastic, \$20. Both are in very good condition. Herman Fothe, 5292 Tiffany Ann Circle, West Palm Beach, FL 33417; (561) 688-2794

SELL/TRADE—LITERATURE

RCA Cunningham Radiotron Reference Book, 1934, \$7.50 plus shipping. John Usconowski, KE2O, 95 Vly Summit Road, Greenwich, CT 12834-9519

Radio Digest, 1922, Volume 1, April to July and Volume 2, July to October, bound into two books. From Chicago, Illinois with interesting articles including one on the WWI battleship Iowa which was completely radio controlled with not a man on board and many more marvels and wonders. Paul Recupero, 265 Union St., Portsmouth, RI 02871; (401) 847-8589

Radio Service Trade Kinks, by Lewis Simon, 209 pages. Case histories of repairs on pre-WWII radios, \$35. shipped. Carl Goatcher, W0HRL, 35 James River Road, Kimberling City, MO 65686; (417) 739-2515

Antique radio repair books, surplus radio conversion manuals and books on radio-TV repair; Amateur Radio Handbooks and other amateur radio

books; Frequency books on top secret federal U. S. government agencies and Interpol police departments and frequency books for scanner radios. Write or call for list. Alan Mark, P.O. Box 372, Pembroke, MA 02359

SELL/TRADE—PARTS

Four section, shielded variable capacitor, 150 pF/section, 11 $\frac{3}{8}$ " L x 5 $\frac{1}{2}$ " W x 4" D, 13/32" shaft on ball bearings. Weight 12 $\frac{1}{2}$ lbs., \$30. William Beckett, 6 Wax Myrtle Lane, Hilton Head, SC 29926; (843) 837-2435; wbeccath@hargray.com

High-voltage capacitors for tube radios. Fresh stock 450V axial E-caps are available at 2 mFd, 4 mFd, 10 mFd, 12 mFd, 16 mFd, 20 mFd, 30 mFd, 40 mFd, 50 mFd and 100 mFd. For price list and product info, please contact Dave Cantelon, 42 Clematis Rd., North York, Ontario, Canada, M2J 4X2; (416) 502-9128; justradios@yahoo.com; www.justradios.com

For the ham builder, one each variable inductor, excellent condition with mint mechanical control and one each variable capacitor, 25 pF to 275 pF, in mint condition, \$25 each. Pick-up in Pensacola, FL. Don Swanson, W8MCI, 8070 BriarOak Dr., Pensacola, FL 32514; (850) 476-5160

SELL/TRADE—TEST GEAR

1941 General Radio Variable Condenser Substitu-

tion Box calibrated 110 pf to 1110 pf, \$90. plus shipping. Carl Goatcher, W0HRL, 35 James River Road, Kimberling City, MO 65686; (417) 739-2515

WANTED—COMMUNICATIONS GEAR

Dial bezel with/without mounting bolts for BC-348Q receiver or junk BC-348Q with bezel. William Mandale, 371 Prussian Lane, Wayne, PA 19087; (610) 687-0917; w2whw@msn.com

WANTED—GENERAL

Classroom demonstration radio board with working(?) AC/DC tube type radio, for our radio club training. Contact Mike Grimes, K5MLG, 3805 Appomattox Circle, Plano, TX 75023; (972) 867-6373

National 7 inch TV set, Model TV-7M or TV-7W. Not working is fine. Top price paid. Thanks. Charles Harper, 2000 Jackstown Road, Paris, KY 40361; charper@kyk.net

WANTED—LITERATURE

Copy of manual or schematic for VHF Aircraft Radio R1021/ARN30D. Robert Martin, 111 Bancroft Dr., Rochester, NY 14616; (585) 663-4182

Manual for Eico Tube Tester, Model 666. Donald Swope, Box 41, Tremont, PA 17981

AWA Reviews Vol. 3, 4 and 5 in good condition. Charles Ritterhouse, 313 Shadylawn St., La Porte, TX 77571; (281) 471-2066; ritterhouse@prodigy.net

WANTED—PARTS

Dial glass or parts chassis with good glass from Philco 39-17, 39-175 or 39-117. Also want Mohawk S-6 chassis, non-working OK. James Fisher, RR1, Box 861, Port Royal, PA 17082 (717) 527-2224; yrless@tricountyi.net

Cabinet for Zenith 5R236 or junker chassis with good cabinet. Marc Ellis, 1914 Colfax St., Evanston, IL 60201; 847-869-5016; mfellis@rcn.com

ABOUT OUR AUTHORS, continued from page 59


ature" column for *The OTB*. Since the 1980s he has been interested in making the vast wealth of information buried in national patent publications more accessible to the public. He thinks he has made a beginning in this work with his latest book, *Radio Patent Lists and Index, 1830-1980*, published by the Edwin Mellen Press. In 620 pages, the book tabulates and indexes 6,200 U.S. and British patents issued to 100 radio and television inventors.



RON LAWRENCE, KC4YOY
Spring Meet in the Carolinas 2004

Ron bought his first antique radio, an AK 20, at age 17, and still has the set. His interest had been aroused after reading a 1969 *Popular Electronics* article on Atwater Kent given to him by his high school electronics teacher. Current collecting interests are early 20s sets, vintage amateur gear, vintage test equipment and tubes.

He studied electronics in the Air Force Crypto School in the early 70s and spent six years in the Air National Guard as a Crypto Technician and Mars radio operator. Ron worked for more than 20 years in the engineering department of Delmar Studios, designing and building photographic equipment. He currently works for PCA International as a electronics tech in the camera repair department.

A licensed ham operator since 1990, he is a past president of the Union County Amateur Radio Society and past ARRL Emergency Coordinator for Union County NC. Ron is also very active in the antique radio community and serves as President and Conference Chairman of the Carolinas Chapter of the AWA. He has been involved in planning and running antique radio meets in the Carolinas since the first Charlotte AWA meet in 1979 and is list manager for the AWA, CC-AWA & the TCA (Tube Collectors Association) email reflectors. 

BUSINESS CARD ADS

Are you offering a product or service of interest to antique radio enthusiasts? Would you like to let the world know about the tubes, sets or paper you'd like to acquire? Place a business card in this space for the low price of \$15.00 and it will be seen by over 4,000 hard core devotees of our hobby. Purchase a year's worth of insertions (four issues) for \$50.00 and save \$10.00 over the individual ad pricing.

Send us a copy of your business card, or a special typeset ad designed to fit our standard space. We can, alternatively, typeset a short message for you (no more than eight lines, 50 characters max per line, please). For the time being, there will be no charge for typesetting. All ads must be for radio-related items or services and must be paid in advance. Send your ads and checks (payable to AWA) to Robert W. Perry, "Smoke Signals," 131 E. High St., Painted Post, NY 14870. Closing date is six weeks prior to first day of month of issue. **All advertising income is used to further the conservation work of the AWA Electronic Communication Museum.**

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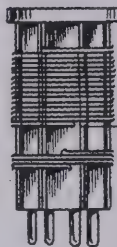
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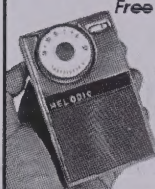
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| 0.0018 182K630V | 0.039 393K630V | |
| 0.002 202K630V | 0.04 403K630V | |
| 0.0022 222K630V | 0.047 473K630V | |
| 0.0025 252K630V | 0.05 503K630V | |
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| 0.004 402K630V | 0.082 823K630V | |
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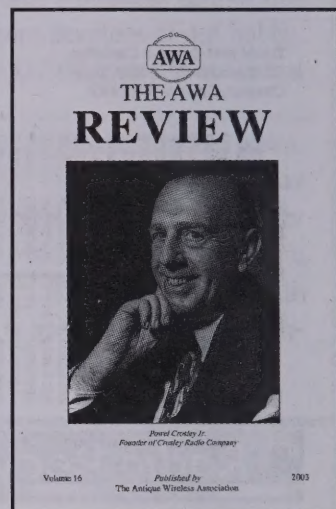
The lead article on Powel Crosley, Jr. and the Crosley Radio Company is by Charles J. Singer, a long-time employee. Crosley's many business endeavors are described, with particular emphasis on radio manufacturing and broadcasting. This particularly detailed paper includes many never-before-seen photographs.

The development of the portable spark transmitter-receiver "pack sets" made, for the U.S. Navy and the Army Signal Corps, is chronicled by the team of Russ Kleinman, Karen Blisard, Jim and Felicia Kreuzer and August Link. This article also includes many early photographs that have never been presented in print.

Charles Kirsten traces the development of the well-known and widely-used Rider's Manuals for radio repair. Few realize the complex stages of development that went into the creation of these books and the influence on them of major characters and personalities in the radio service field.

An unusual article by Barbara Havranek addresses an often-overlooked aspect of radio history: the speaker grill cloth. The author, an expert in the field of industrial design, discusses both the aesthetic and technical aspects typical cloths. A full-page color plate shows thirty-four of the designs discussed in the text.

This volume also includes a cumulative table of contents of all the *AWA Reviews* produced since publication began in 1986. *Price, \$19.95 postpaid in U.S. and Canada; elsewhere, add \$5.00.*



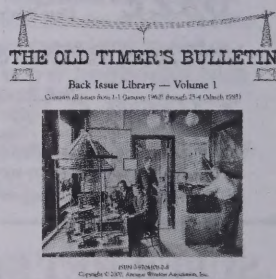
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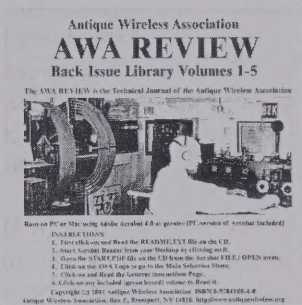
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Another out-of-print classic, *The Hallicrafters Story* by Max Dehenseler, HB9RS, is also back as a CD. Max De Henseler was a personal friend of Hallicrafters founder Bill Halligan, and his book provides unusual insights into Halligan's life and early struggles. This well-illustrated book has 245 pages, a nice index and several handy lists of models and features. The CD can be displayed on any PC with Acrobat Reader version 6.0 or higher.* Thanks so much to Max De Henseler for his thoughtful gift of publishing rights to the AWA Museum. Price is \$14.95, postage paid in U.S. and Canada; elsewhere, add \$5.00.

*Acrobat Reader is a free program that can be had via the world-wide-web.

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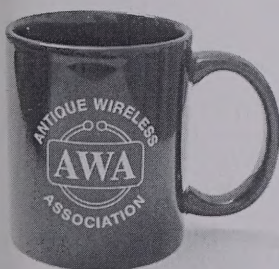
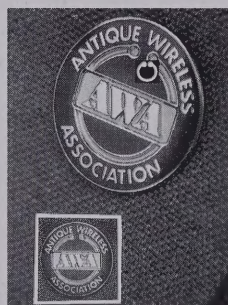


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